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Hill tribes struggling for a land deal:

Participatory land use planning in northern Thailand amid controversial policies

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Abstract (Deutsch)

Das Hochland Nordthailands isi ein Beispiel für eine widersprüchliche Situation die entsteht, wenn ein zentralistisches Regierungssystem seine Kontrolle auf entlegene Gebiete ausdehnt und auf traditionellen Wanderfeldbau auftrifft. Auf Regierungsseite zeichnet sich die Politik durch unterschiedliche Interessen der Walderhaltung einerseits und Integration von ethnischen Minderheiten andererseits aus. Die Bergstämme ihrerseits erstreben Landsicherheit um ihre Subsistenzwirtschaft zu sichern. Somit geht es um Mediation und Konfliktresolution zur Überwindung der Dichotomie zwischen Waldschutz und landwirtschaftlicher Subsistenz.

Trotz des fehlenden politischen Rahmens, hat es eine Verschiebung zu mehr partizipativen Ansätzen bei der Entwicklung des Hochlands gegeben, zum Beispiel Community Based Land Use Planning and Local Watershed Management (CLM) des Thai-German Highland Development Programe (TG-HDP) in der Provinz Mae Hong Son. Dieses Forschungsprojekt hat den CLM-Ansatz mit GIS kombiniert um jenseits der Demarkierung von Landtypen die Dorfebene mit höheren Planungsebenen zu verbinden, wie die sich etablierenden Tambon (Sub-Distrikt) Administrative Organisations. Vor dem Hintergrund der grundsätzlichen oben angeführten Probleme und auf den CLM-Ansatz aufbauend, wurden Landnutzungskarten digitalisiert um die Widersprüche zwischen zentralistischer Landklassifizierung und lokalen Dorfgrenzen zu überwinden. Durch den Vergleich von topographischen Modellen und Karten mit Dorfbewohnern und Regierungsorganisationen, könnte eine Kommunikationsplattform für die Formulierung von Landnutzungsplänen etabliert werden. Stolpersteine zur partizipativen Planung werden dargestellt und Empfehlungen für eine koordinierte Politik der Hochlandentwicklung ausgesprochen.

Bei der laufenden Dezentralisierung werden die neu entstehenden Tambon (Sub-Distrikt) Administrative Organisations (TAO) sich als Schlüsselverbindung zwischen dem Staat und der Gesellschaft entwickeln. Eine Möglichkeit mit den unterschiedlichen Prioritäten der Teilhaber auf Tambonebene umzugehen könnte sich aus der laufenden Umstrukturierung des Landwirtschaftsministeriums (MOAC) ergeben, als Teil der administrativen Reform. Ein Teil dieser Reform auf Grasebene war die Einführung von Technology Transfer Centres (TTC) seit 1998, mit mittlerweile 82 vom Department of Agricultural Extension (DOAE) etablierten Zentren landesweit. In diesem Kontext wird der Tambon ein Test für partizipative Landnutzungsplanung sein, sowohl aus der technischen Perspektive mit neuen Technology Transfer Centres, als auch aus der administrativen mit existierenden Tambon Administrative Organisations. Pläne der Vernetzung von TTCs mit TAOs müssen die Bedeutung der Repräsentanz von Schlüsselinstitutionen der Forstwirtschaft und Landentwicklung für Aspekte der Landnutzung berücksichtigen, sowie lokale Verwaltung und Sozialfürsorge für die Registrierung von Dörfern mit klaren und allseits akzeptierten Grenzen.

Ein Ansatz von unten müßte sich auf die drei während der Forschung genannten Hauptprobleme konzentrieren, nämlich Reisinsuffizienz, Waldbrachemanagement und Dorfgrenzen. So lange der Zustand der Landunsicherheit weiterhin vorherrscht, werden Bergstämme Strategien zur Beibehaltung von ausreichendem Ackerland anwenden, wie die Deklaration von bis zu doppelt so vielen Hochlandfeldern und die Zwischenpflanzung mit Heckenreihen auf Bracheflächen um zu zeigen, daß dieses Land genutzt wird. Zur Zeit gibt es keinen einheitlichen Planungsansatz, jedoch hat die öffentliche Debatte in Nordthailand ein Stadium erreicht, inklusive der Bergstämmenminderheit, daß der Prozeß der Institutionalisierung weitergehen wird während das Land den Pfad der Demokratie beschreitet. Die Lösung von Problemen und nachhaltiger Landnutzungsplanung wird somit zu einem Testfall für die Umsetzung von guter Regierung auf lokaler Ebene.

Abstract (Englisch)

The highlands of northern Thailand are an example of a contradictory situation arising when a centralised government system extends its control to remote areas and clashes with traditional shifting cultivation practices. On the government side, policy is characterised by conflicting interests between forest preservation on the one hand, and the integration of ethnic minorities on the other. Hilltribes, on the other hand, are looking for land security to meet their subsistence needs. It is a precondition for them to modify their traditional farming systems or to explore other alternatives to secure a livelihood. The issue has become one of mediation and conflict resolution in order to overcome the dichotomy between forest protection and agricultural subsistence.

In spite of a lack of policy framework, highland development has shifted towards more participatory approaches, for example Community Based Land Use Planning and Local Watershed Management (CLM) of the Thai-German Highland Development Programme (TG-HDP) in Mae Hong Son province. This research project combined the CLM approach with GIS in order to go beyond the demarcation of land types and to connect the village level to higher planning bodies like the emerging Tambon (sub-district) Administration Organisations. In light of the fundamental problem of highland development described above, and building on the CLM approach, land use maps were digitised to help overcome contradictions between central land use classifications and local village boundaries. By crosschecking topographic models and maps with villagers and government agencies, a communication platform could be created for the formulation of land use plans. Stumbling blocks to participatory planning are illustrated and recommendations for a co-ordinated policy for highland development are made.

In the current move towards decentralisation, the newly forming Tambon (or sub-district) Administrative Organisations (TAO) will evolve as the key link between the state and society. One potential to deal with differing stakeholder priorities at Tambon level could evolve from the current restructuring of the Ministry of Agriculture and Cooperatives (MOAC) as part of the administrative reform. A part of this reform at grass-roots level has been the introduction of Technology Transfer Centres (TTC) initiated in 1998, with 82 of them established nationwide by the Department of Agricultural Extension (DOAE). In this context the Tambon will be a test for participatory land use planning, both in terms of a technical perspective with new Technology Transfer Centres, as well as an administrative one with existing Tambon Administrative Organisations. The plans to link TTCs with TAOs need to consider the importance of representation of key agencies like forestry and land development for aspects of land management, as well as local administration and social welfare for the registration of villages with clear and mutually agreed boundaries.

A bottom-up approach would need to focus on the three main problem areas identified during the research, namely rice sufficiency, forest fallow management, and village boundaries. As long as this state of land insecurity persists, hill tribes will resort to strategies to keep enough land for agricultural production, like the declaration of up to twice the number of upland fields under cultivation, and the interplanting of hedgerows in fallow areas to indicate that the land is used. For the time being a unified planning approach does not exist, but a stage of public debate has been reached in northern Thailand, including those of minority hill tribes, that the process of institutionalisation will continue as the country follows a path to democracy. The resolution of problems and sustainable land use planning will turn into a testing ground for the application of good governance at the local level.

Keywords (Englisch):
Natural resource management,
Land use planning,
Tambon Administrative Organisation
Policy framework

Keywords (Deutsch):
Natürliches Ressourcenmanagement,
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Politische Rahmenbedingungen

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Abbreviations

ADB	Asian Development Bank
ADR	Action and Development oriented Research
AEZ	Agro-Ecological Zone
ALRO	Agricultural Land Reform Office
ASB	Alternatives to Slash and Burn
CFA	Community Forestry Act
CLM	Community Based Land Use Planning and Local Watershed Management
CMU	Chiang Mai University
COHAN	Centre for Coordination of Hill Tribe Affairs and Eradication of Narcotic Crops
CRCDP	Crop Replacement and Community Development Project
DHC	District Hill Tribe Committee
DLD	Department of Land Development
DOAE	Department of Agricultural Extension
DOL	Department of Lands
DOLA	Department of Local Administration
DPW	Department of Public Welfare
FAO	Food and Agriculture Organisation
FIO	Forest Industry Organisation
FSR	Farming Systems Research
GIS	Geographic Information System
GO	Government Organisation
GPS	Geographic Positioning System
GTZ	Gesellschaft für Technische Zusammenarbeit
HADF	Hill Area Development Foundation
ICRAF	International Centre for Research in Agroforestry
IIED	International Institute for Environment and Development
IMPECT	Inter Mountain Peoples Education and Culture in Thailand
ITK	Indigenous Technical Knowledge
LIS	Land Information Systems
LUP	Land Use Planning
LUPT	Land Use Planning Team
MHS	Mae Hong Son
MOAC	Ministry of Agriculture and Cooperatives
MOI	Ministry of Interior
MRC	Mekong River Commission

NEB	National Environment Board
NESDP	National Economic and Social Development Plan
NGO	Non-Governmental Organisation
NNCO	Northern Narcotics Control Office
ONCB	Office of Narcotics Control Board
PLP	Participatory Land Use Planning
PRA	Participatory Rural Appraisal
PWA	Participatory Working Approach
RFD	Royal Forest Department
RRA	Rapid Rural Appraisal
RRD	Regional Rural Development
RSD	Royal Survey Department
SFS	Sustainable Farming System
SMDP	Sam Muen Highland Development Programme
SMRP	Sustainable Management of Natural Resources Project
STK	National Forest Land Allotment Project (in Thai)
SWC	Soil and Water Conservation
TA-HASD	Thai Australian Highland and Social Development
TAO	Tambon Administrative Organisation
TC	Tambon Council
TDRI	Thailand Development Research Institute
TFSMP	Thai Forestry Sector Master Plan
TG-HDP	Thai German Highland Development Programme
TÖB	Tropical Ecological Support Programme
TTC	Technology Transfer Centre
UN	United Nations
UNCED	United Nations Conference on the Environment
UNDP	United Nations Development Programme
UNEP	United Nations Environment Programme
UNFDAC	United Nations Fund for Drug Abuse Control
USA	United States of America
USDA	United States Department of Agriculture
UTM	Universal Transverse Mercator

1 Introduction

1.1 A short glimpse of conflicts over the highlands

"The new government must amend draconic forestry laws and recognise the indigenous people's constitutional and community rights, to prevent land conflicts from escalating into ethnic violence" (BANGKOK POST 2000).

The above refers to the long conflict since the 1980s in Chom Thong district of Chiang Mai over water and land between lowland Thais and highland Karen as well as Hmong living and farming in the Doi Inthanon National Park founded in 1972. Lowland villagers had repeatedly closed access roads and set up roadblocks in the past to force relocation of the Karen and Hmong whom they accuse of water overuse, but in August 2000 they even raided lychee orchards and set fire to houses, and it was luck that no one was killed. These clashes show the increasing competition over natural resources as land and water become scarce or are overused, and epitomises the fate of hill tribes in Thailand caught between recent forest protection laws and lowland Thais moving into the hills, a conflict so severe that it is even dubbed the "*Chom Thong Water Wars*" (RATNER 2000,6). It has to be remembered that the Karen and Hmong had settled in these hilly areas long before it was declared a national park. This case demonstrates how a conflict over watershed resources can link to broader conflicts of social values and national policies, and should be seen as a serious warning to finally deal with contradicting highland policies and administration before the conflict deteriorates.

The issue of natural resource conservation with increasing populations is loaded with conflicts in the Asian *"Tiger countries",* so named after a decade of seemingly unlimited economic growth in the 1980's. The use of the tiger as a symbol of strength, it is after all the largest cat, bears a sad irony, as it is quickly approaching extinction as a price for unlimited land expansion for agriculture as well as logging enterprises. Why the allusion to the tiger? In a larger context, this animal represents the state of natural resources in South East Asia with rapidly degrading and disappearing forests, which after years of logging have been further decimated through two consecutive years of massive forest fires in 1997 and 1998. These were attributed to the natural phenomenon of El Niño, a meteorological process that leads to high temperatures and a much lower rainfall in the rainy season in the tropics and subtropics. Thailand has followed a path of economic success to the point where it was given the nickname of a *"small tiger"* in the Asian context, yet this success has come at the expense of a massive environmental exploitation. The tiger has nearly disappeared in Thailand and so have most of its forested areas, and now the government tries to cling on to the last remains through contradictory policies of forest conservation and reforestation as well as agricultural intensification. This has brought the previously autonomous hill tribes in remote mountainous areas into contact with government agencies with diverging sectoral development priorities.

1.2 The mountainous north and Mae Hong Son province

The key factor that triggered international highland development was the attempt of the Thai government to eliminate opium (*Papaver somniferum*) cultivation, first by outlawing it in 1959, followed by the Crop Replacement and Community Development Project (CRCDP) set up in Chiang Mai in 1971 (RENARD 1997,316). This was the first project funded by the United Nations Fund for Drug Abuse Control (UNFDAC), which two years before had been especially founded for that purpose (TAN-KIM-YONG et al. 1994,3). The area it focused on has become world-famous as the *"Golden Triangle"*, a term created by US Marshall Green in 1971 that designated an area where Thailand, Laos and Burma have a common border along the Mekong river (RENARD 1997,308). Opium control was subsequently institutionalised in 1975 with the establishment of the Thai Central Committee for Drug Abuse Control, and a year later the Office of Narcotics Control Board (ONCB) was set up to act as the coordinating agency for drug abuse suppression programmes (DIRKSEN 1997,331). This meant that one of the oldest European crops for medicinal purposes, exported since the 8th century worldwide, was suddenly declared an evil threat to Europe as it returned in the form of a drug. One should recall that Britain, France and the USA even fought two Opium

Wars (1839-1842 and 1856) against China (which had outlawed it in 1729) to market opium in the name of free trade (BROSZAT 1992,24), and the sudden change of perception may be seen as an irony of colonial history. Thailand had also been forced to allow opium imports by the USA after the second Opium War, though 100 years later and under the influence of US and European priorities of opium suppression, the country was urged to suppress opium production.

Photo 1-1: The root of highland development (*Papaver somniferum*)

1.2.1 Location and physical environment

The northern part of Thailand is composed of 18 provinces and covers an area of 169,644 km^2 or 33 % of the country, and is bordered by Laos to the east and Burma to the west (Figure 1-1). The north lies between the latitudes 15 °N and 21.5 °N, and the longitudes 97.3 °E and 102 °E. The lower north includes alluvial plains and terraces that comprise the upper delta of the Chao Phraya River, while the upper north is more extreme and includes higher terraces, hills and mountains (Doi Inthanon is the highest at 2,590 m). Within the region there exists a series of mountain ranges running north to south that form the catchment areas of the Ping, Wang, Yom and Nan rivers. The area is divided into three major land forms (after BUDDEE 1985,19):

Lowlands; fertile alluvial areas up to 200 m elevation with finely textured, slowly permeable soils (Orthic Acrisols) or medium textured well-drained ones.

Uplands; older alluvial deposits in terraces up to 500 m elevation with podzolic soils (Orthic Acrisols) and loamy red latosols (Dystric Nitosols). Most soils are relatively infertile with organic matter levels below 2 %, a low base saturation and usually acid with a pH of 5.0-6.5, with moderate to rapid permeability.

Highlands; ranging from 500 to 2,500 m altitude, consisting of flat plateaus to steep mountains with loams overlaying clays. Highland soils cover about 80 % of the north and are extremely complex and diverse (referred to as *"Slope Complex"*), moderately fertile (organic matter 3.5-5 %), acidic (pH 5.3-5.6) and are phosphorus and sulphur deficient. The rock types include limestone, shale/schist, granite and sandstone.

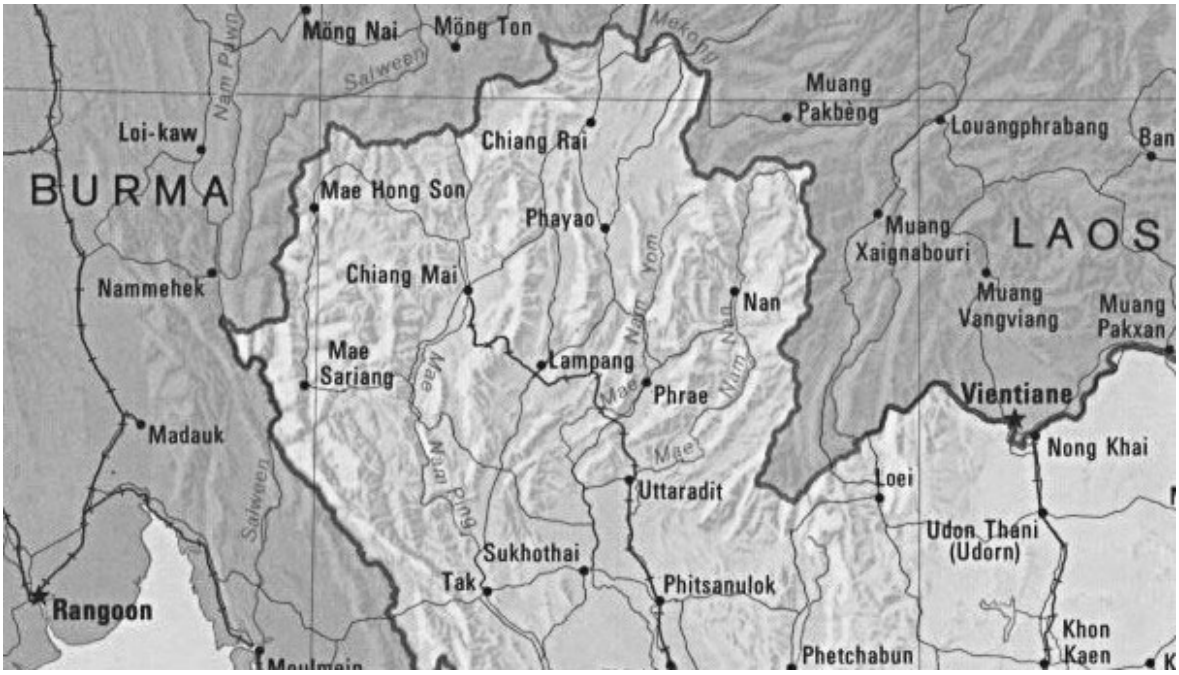


Figure 1-1: The mountainous north of Thailand

The climate of northern Thailand is monsoonal with 3 distinct seasons: a wet season (May-October), a cool and dry season (November to January and a hot and dry season (February-April). Most of the rainfall (90 %) comes with the passing of the inter-tropical convergence zones during April-May (moving north) and August-September (moving south). The rainfall pattern is bimodal, as rainfall decreases a bit in June-July, and between November and April there is only little rain. Temperatures in the wet season are around 27-30 °C, while in cooler months from 20 to 30 °C, with a mean monthly minimum of 12-17 °C. The north has a mean monthly rainfall of 1,100-1,500 mm (RFD 1999,website). In Mae Hong Son there is a broader temperature range from mean monthly minima of 9 °C in January and maxima of up to 42 °C in April, with an annual mean of 25.8°C. Over the last years, the monthly rainfall ranged from 934 mm (1998) to 1,435 mm (1994). Most of Mae Hong Son consists of steep mountains (90 %), while the lowland area only covers 10 % of the province (RFD 1997,1).

1.2.2 The hill tribes

The mountains of Thailand were populated from the lowlands upwards in a time sequence, whereby the earliest settlers were northern Thais who occupied the lower areas (up to 1,200 m), followed by a number of Tibeto-Burman mountain peoples moving south from China. Thailand has regularly experienced migration from ethnic minorities over time, yet particularly since the 2nd World War the majority of migrants have fled wars in neighbouring countries. Highland peoples have been classified according to ethnicity and the elevation they live and are spread over 20 provinces, with 90 % living in the Upper North. (ADB 2000,4). Six major distinctive ethnic groups represent more than 90 % of the total hill tribe population in Thailand: Karen (46.3 %), Hmong (17.9 %), Lahu (10.5 %), Akha (6.9 %), Yao (5.8 %) and Lisu (4.7 %). The White Karen (subdivided into *Sgaw* and *Pwo*) came up to 300 years ago and settled between 600-1600 m, followed up to 100 years ago by Yao, Akha, Lahu (two groups: Black Lahu with subgroups of *Lahu Nyi, Lahu Na* and *Lahu Sheleh*, and Yellow Lahu subdivided into *Ban Lan* and *Ba Keo*) and Lisu at 800-1,800 m, and up to 80 years ago by the Hmong (subdivided into *White* and *Blue*) at 1,000-2,000 m (KUNSTADTER et al.1978,9 and GANJANAPAN 1998,75).

Current population figures for hill tribes are estimated at 1 million, but need to be seen with reasonable doubt, particularly since by 1988 only 65 % of the hill tribes had Thai citizenship (AGUETTANT 1996,65), and

at least 15 % of the population has not yet been registered. The hill tribe population for Mae Hong Son province is over 123,000, with the highest national hill tribe ratio of 50 % (Table 1-1), while Thai citizenship figures have reached 73 % in 1996. Hill tribes have a higher growth rate than Thais (3 % compared to 1.5 % for Thais) and due to the ongoing Burmese-Shan civil war there is in-migration (RERKASEM and RERKASEM 1994,6). Nevertheless, they still amount to only 1.6 % of Thailand's population that has also grown rapidly over the last 40 years to nearly 62 million. The north still has a relatively low population density of 71.3, while Mae Hong Son continues to have the lowest national population density with 18.3 people/km^2 and hosts 13 % of Thailand's hill tribes.

Photo 1-2: Karen women cooking

Photo 1-3: Hmong flute player

Table 1-1: Population growth over 40 years in Thailand and Mae Hong Son

Year	Population of Thailand				Mae Hong Son Population	
	Total (million)	Density (people/km^2)	Hill Tribes (thousand)	Proportion Hill Tribes (%)	Total (thousand)	Hill Tribes (thousand)
1960[a]	26.3	51.3	217	0.8	80.8	No record
1970[a]	34.4	67.0	284	0.8	104.2	49
1991[b]	57.0	111.1	750	1.3	174.8	107
1999[c]	61.7	120.2	990	1.6	232.5	123
Area of Thailand 513,115 km^2			Mae Hong Son hosts 13 % of Thailand's hill tribes			

[a] Data from KUNSTADTER et al. (1978,27) and YOUNG (1962,5); [b] Data from RERKASEM and RERKASEM (1994,6); [c] Data from ADB (2000,6).

1.2.3 Vegetation and land use

Northern Thailand's endemic vegetation consists of tropical evergreen and deciduous forests, further subdivided by altitude and species composition (ANDERSON 1993,39):

Tropical Evergreen Forests

- Further subdivided into *Lower Montane* forests at elevations above 1,000 m and higher annual rainfall (1,500-2,000 mm), and *Dry Evergreen* forests extending down to 500 m and annual rainfall as low as 1,000 mm. The most common species are oaks, false chestnuts, laurels, birch, *Anisoptera oblonga*, dipterocarps, *Euphoria longana* and genus *Aglaia*. On the ground story there are shrubs, bamboos and lianas.
- *Coniferous* forests are found at elevations above 1,000 m, annual rainfall of 1,000-1,500 mm, they are composed of *Pinus merkusii* and *P. kesiya*, as well as oaks and false chestnuts, and shrubs as well as grasses on the ground story.

Deciduous Forests

- Mixed Deciduous forests range from 1,000 m to the lowlands and an annual rainfall of 600-1,500 mm. The most common species are teak, Lagerstroemia tomentosa, Mitragyna brunonis, Xylia kerii, Dalbergia ovata, and shrubs, ferns, bamboos and epiphytes in the lower story.
- Dry Dipterocarp forests range from 1,000 m to the lowlands, yet with an annual rainfall under 1,000 mm and are dominated by Dipterocarpaceae, Quercus kerii, while shrubs, tubers and bamboos are in the lower story.

Thailand has experienced a drastic disappearance of forest cover (tree canopy density greater than 10 %). It is estimated that at the turn of the century 75 % of the land was forested (MCKINNON 1997,118), decreasing to 60 % in 1938 and 53 % in 1961 (RFD 1993,9). The decline further continued to 26 % in 1991 and pessimistic figures place it as low as 15 % (MAXWELL 1997), or 12 % in terms of closed forests (tree canopy density greater than 40 %; UNEP 2001,6). The north fared comparatively better with a forest cover decrease from 68 % in 1962 to 43 % in 1998 (Table 1-2). The main reasons for deforestation since 1960 have been, first the conversion of forest for agriculture, followed by national security strategies encouraging forest clearance for economic growth in the 1970s, and to a certain extent hill tribe farmers in the forest (SURASWADI et al. 2000,4). The forest figures for Mae Hong Son province (area 12,681 km^2) show a rather stable situation with 74 % forest cover in 1985, which declined to 69 % in 1998 (RFD 1999).

Table 1-2: Evolution of forest cover decrease in northern Thailand

Area of northern Thailand: 169,644 km^2. Forest cover area (km^2)							Mae Hong Son	
Forest type	1962[a]	%	1982[b]	%	1998[b]	%	1998[b]	%
Tropical evergreen	17,497	10.3	25,568	15.1	21,161	12.5	684	5.4
Mixed deciduous	41,329	24.4	25,006	14.7	32,325	19.1	5,637	44.5
Dry dipterocarp	53,144	31.3	34,318	20.2	17,913	10.6	2,225	17.5
Scrub	1,913	1.1	846	0.5	2	~	-	-
Pine	1,340	0.8	2,018	1.2	1,620	1.0	220	1.7
Bamboo	-	-	-	-	34	~	-	-
Total	115,223	67.9	87,756	51.7	73,055	43.1	8,766	69.1

[a] Data from RERKASEM and RERKASEM (1994,12); [b] Data from RFD (1999,website)

The forest farming systems in the highlands were based on shifting cultivation, whereby families cleared and burned a part of the forest for cultivation. It was practised by both lowland Thais as well as hill tribes in different forms (RERKASEM 1998,2). Rice has always been the major crop, supplemented more recently by various cash crops like vegetables, fruit trees, cotton, maize, beans, manioc, sorghum, taro, chillies and herbs, as well as poppy and extensive livestock production. Wherever possible, wetland rice cultivation supplemented the production of lower yielding upland rice (Photo 1-4). The annual cycle of cultivation was similar for all systems, starting in February with the cutting of swiddens and forest burning, planting in May-June, and regular weeding till harvesting in October-November.

Photo 1-4: Wherever possible, paddy fields are established in Mae Hong Son

There was a great variety of land use systems among ethnic groups, and the types of forest farming have been classified on the relationship between cultivation and fallow periods, with historically three types of swidden cultivation (KUNSTADTER et al. 1978,7):

- **Short cultivation-short fallow** (northern Thai); only supplementary to irrigated wet-rice cultivation in transitional zones between valley and hill lands at elevations between 200-800 metres.
- **Short cultivation-long fallow** (Karen); Rotational swiddening on sloping land in addition to wet-rice cultivation on terraced fields at elevations between 700-1,600 m, there is no opium cultivation (Photo 1-5 and 1-6).
- **Long cultivation-very long fallow** (Hmong, Yao, Akha, Lahu and Lisu); Pioneer swiddening on steep slopes and opium cultivation as a cash crop at elevations between 800-2,000 m.

Photo 1-5: Burning of swidden fields by Karen in Mae Hong Son

Photo 1-6: Emergence of highland rice on Karen swidden fields

As a general picture, mountain settlement in Thailand has been a combination of ethnicity, altitude and vegetation represented in a transect (Figure 1-2).

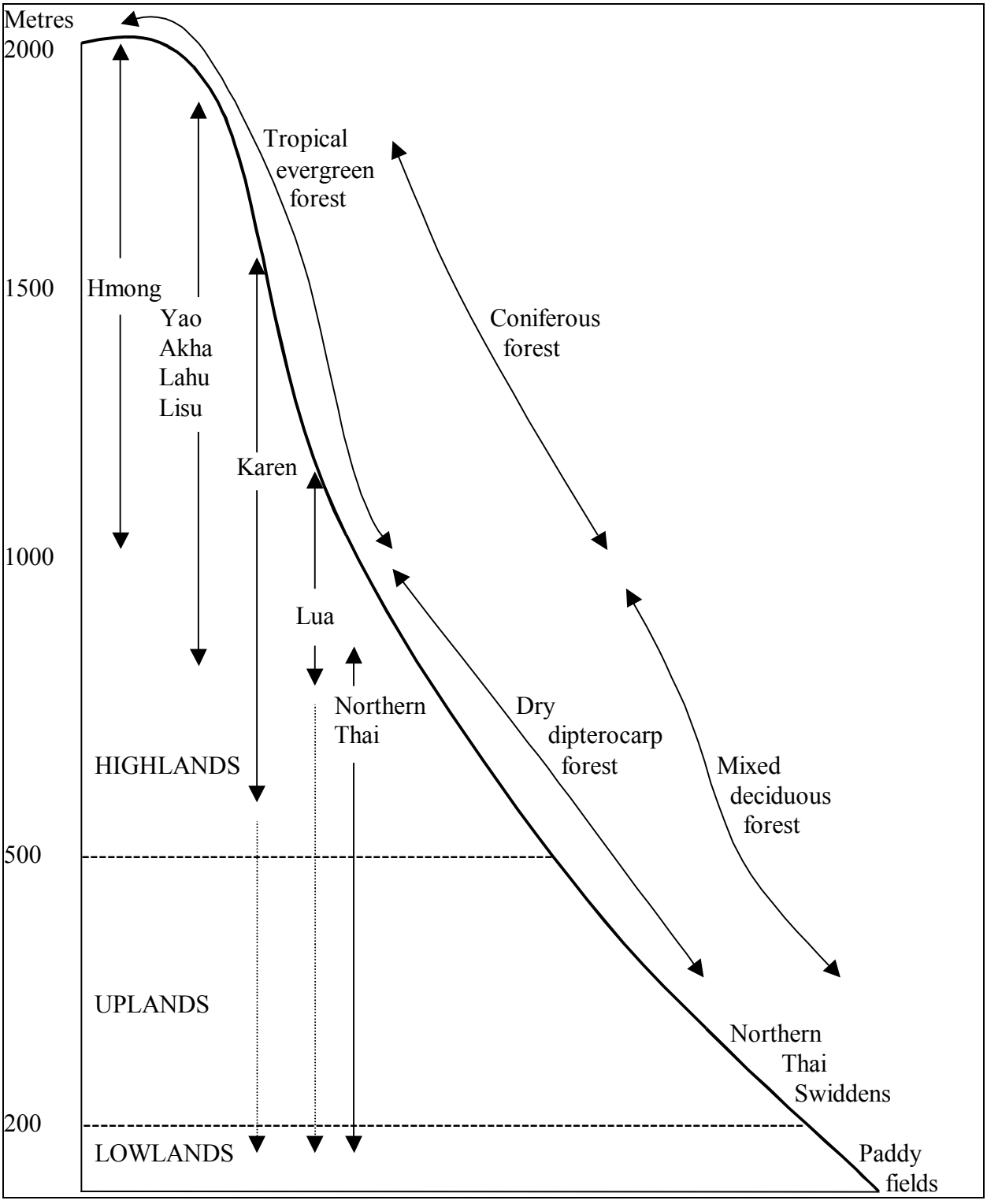


Figure 1-2: Mountain settlement transect (after KUNSTADTER et al. 1978,8)

A comparison between rotational and pioneer swiddening reveals the differences with regards to soil cultivation and forest fallow (Table 1-3). Recent studies have found that pioneer shifting cultivation has now largely disappeared, but rotational shifting agriculture can still be found in areas of relatively low population density. Areas under pioneer shifting cultivation have experienced forced resettlement or *"voluntary village relocation"* to lower lying areas by the government in the name of national security (1960s) and forest conservation (1970s), accompanied by a strong discouragement of traditional farming (RERKASEM 1998,4). Pioneer swiddening was thus replaced by very short rotations with one- or two-year fallows (GANJANAPAN 1998,75), so nowadays their systems resemble that of the traditional northern Thais. In consequence, the middle zone (600-1,500 m altitude), mainly inhabited by Karen, experienced a rapid population increase as a result of this migratory flow as well as Thais from the lowlands. It has become very difficult to maintain traditional Karen rotational systems with long fallows, and with the inflow of people from all areas the competition for land has become so intense, that it was dubbed the *"Middle Zone Crisis"* (TAN-KIM-YONG 1993,73).

Table 1-3: Traditional pioneer and rotational swiddening (after RERKASEM 1998)

Pioneer Swiddening	Rotational Swiddening
Altitude 800-2,000 m, limestone soils and practiced by Hmong, Yao, Akha, Lahu, Lisu.	Altitude 700-1,600 m, red clay or lateritic soils and practiced by Karen as well as Lua.
After burning, a field is cultivated for 4-5 years till declining soil fertility or too much secondary growth. Farmers move on to look for new areas and grass fields are abandoned.	After burning, an area is cultivated for 1 year only and left to fallow for 6-15 years to rejuvenate before farmers return, a cyclical pattern ensuring rich biodiversity.
Trees are cut and uprooted, deep hoe cultivation and clean weeding, tree regrowth not possible and fields covered by *Imperata.*	Trees are cut at breast height, but not uprooted, to allow regrowth, mulching, fodder and seed production, there is no hoeing.
Rice only is grown in the rainy season followed by opium, crop rotation.	Mixed cropping of rice with vegetables and cash crops, but no opium cultivation.
Very scattered fields, when abandoning an area the whole village moves to new place.	Joint cultivation of larger field clusters and permanent settlement in an area.

1.3 The controversy over land degradation

*"*Nomadic hill tribes practise shifting cultivation by reckless clearing of forests" *(BANIJBATANA 1962,5; Deputy Director General of the Royal Forest Department).*

Towards the late 1960s considerable concern began to be expressed about the impact of economic growth on the environment and the degradation of natural resources. A landmark in this context was the report "*The Limits of Growth*" produced by the group of mainly western scientists called the Club of Rome. This concern has led to the First United Nations Conference on the Environment (UNCED 1) in Stockholm in 1972, and twenty years later to UNCED 2 in Brazil, where the document Agenda 21 was formulated as an action plan for human development in relation to the environment (UNCSD 1997). In this context there emerged a continuous debate on resource degradation, where degradation is defined as "*a process leading away from an optimum".* Land degradation includes land loss to non-agricultural uses (urbanisation), desertification and soil degradation, and is caused by erosion, salinisation, burning, pollution and deforestation. Critical voices on the other hand claim that degradation is a term that has been formulated as a theory for the Himalayas to explain accelerating deforestation and soil erosion that eventually lead to ecological collapse. The extent to which such claims are supported by facts remains controversial, to the point that policy objectives might be supported by "*what one wants the facts to be*" (FORSYTH 1996,376), thus requiring more scientific proof for justification. This criticism implies that little effort has been made to formulate objective indicators to measure degradation and that the few existing

ones ignore the awareness of local people, based on which they develop strategies to cope with problems.

In northern Thailand rapid changes in land use were a complex matter driven by internal forces like population increases as well as commercial agriculture with increased productivity, and external forces related to government policy such as nationalisation, enforcement of forest and watershed conservation, suppression of opium production, and improved infrastructure. These had impacts on traditional land use like diversification and spatial distribution, to the point that shifting cultivation in northern Thailand is nowadays characterised as *"degraded"* (SOMBATPANIT et al. 1993,310; SUWANNARAT 1996,46; RENAUD et al. 1998,345; SCHMIDT-VOGT 1998,135). Land degradation is a somewhat unclear term in Thailand and needs to be examined from various perspectives of land use.

The two main criticisms hill tribes are exposed to refer to their swiddening systems, said to cause deforestation and erosion mainly due to rapid population increase, yet there have only been few scientific studies carried out to verify that claim. It is therefore important to note that a correlation between forest loss and population does not support that (RERKASEM and RERKASEM 1994,33; GANJANAPAN 1998,75). In one of the few surveys, it was shown that for the years 1982-1989 the loss of forest cover correlates more strongly with annual population increases of lowland population (R^2 = 0.83) than with the size of hill tribe population in 1986 (R^2 = 0.37) or 1993 (R^2 = 0.51), or with annual hill tribe population increases (R^2 = 0.65) over the same 13 years (RERKASEM 1994,13). Hence attempts to save the forest cover that focus only on hill tribes and their agricultural practices are doomed to fail, since most of the damage comes from other sources.

In relation to forestry, degradation either occurs by disturbance like selective felling, burning or grazing without destroying the forest, or the emergence of secondary vegetation as a result of forest destruction (SCHMIDT-VOGT 1998,136). Therefore an assessment of shifting cultivation needs to include ecological, geoecological and economic functions in order to give justice to the complexity.

Ecological functions refer to species loss and reduction of structural complexity. Secondary forests have greater species diversity than mature stands, though they have a lower stand structure, but are denser than natural forests (SCHMIDT-VOGT 1998,145). Pioneer swiddening causes the slowest forest regrowth, with the lowest amount of trees, crown cover and tree height. Rotational swiddening (by Karen) allows fast tree regeneration, creates biodiversity, high crown cover and tree height. A rare positive statement from a forest official on rotational swiddening admitted (KANJUNT 1995,30):

"This system does not contribute to further deforestation in Thailand".

Geoecological functions refer to a reduced capacity to regulate hydrological processes, microclimate and denudation. As far as water is concerned, an analysis of the stream flow has shown that land use practices in the highlands have not altered hydrological regimes or have contributed to an increase in sediment load of rivers since the 1950s (ALFORD 1992,267; ENTERS 1992,178). The mountain catchments have a very low *"runoff efficiency"* of 20 % (i.e. water leaving a basin as surface runoff), so that catchments in northern Thailand are among the most arid on earth. This is possibly due to high evaporation or human land use like irrigation in the lowlands, but has not been confirmed.

As for sediment flow, northern Thailand also has one of the lowest worldwide with an average of 100 t/km^2. Erosion is a very hot topic in Thailand, with figures ranging from slight erosion of 5 t/ha/year (TURKELBOOM et al. 1996,27) to severe erosion of 300 t/ha/year (SEETISARN 1996,28) in the highlands, though more accurate figures showing moderate erosion of 28-64 t/ha/year were obtained using Cesium-137 (FORSYTH 1994,229). There is a widespread awareness of erosion among hill tribes and generally the most important problem of land shortage results in an increased frequency of farming on flat slopes instead of steep slopes (DURNO 1996,6). Declining soil fertility is thus more the result of over cultivation than nutrient removal by erosion (SALZER 1993,225). It has to be added that erosion is a very site-specific

problem and it is rarely possible to directly link erosion and soil fertility (van KEER et al. 1998,72).

Economic functions are assessed in terms of loss of economically useful species and sizes. Swiddening (particularly rotational) increases species diversity, and the proportion of plants used for specific purposes varies with successional stages (Photo 1-7). In early stages herbs and grasses are found, later food products like fruits and bamboo, and eventually firewood and timber trees. In swidden systems there is a large number of useful species and most trees are multipurpose trees (ANDERSON 1993,83).

Photo 1-7: Regenerating forest fallow after 1 year (Karen swidden)

An intensification of swiddening leads to the replacement of forests by grasslands and bamboo groves, as well as to retarded development of species poor secondary forests. A policy of replacing swidden cultivation by permanent farming is only possible with high fertiliser inputs and pesticides, cash crops and good management (ENTERS 1992,167). If cash crops are widely spaced, they become more conducive to soil erosion than rice. Reforestation in Thailand is usually done with a limited number of species and produces inferior forests (SCHMIDT-VOGT 1998,148). The issue of degradation has even prompted an international workshop on the rehabilitation of degraded forests with a focus on policy in November 1999, at which participatory land use planning and the roles of communities in forest management were highlighted as the main unresolved issues (GILMOUR 1999,9).

The above discussion shows that land degradation has become a more clearly defined issue over time, moving beyond deforestation and erosion due to population growth as the only parameters. Yet while the understanding has broadened to also consider ecological, geoecological and economic factors, there are to date no universal guidelines with indicators to assess land degradation. As this proof is lacking, one is forced to accept that swiddening does not necessarily cause degradation, even with increasing population densities, and it would thus be important to include logging as a main contributing factor. If one examines the governments' efforts to eliminate shifting cultivation, describing it as something destructive, then

perhaps there is no need for scientific proof, as it would not be accepted by policy makers anyway. What is clear is that all extension initiatives by the Department of Agricultural Extension (DOAE) or the Department of Land Development (DLD) do not include shifting cultivation as a viable option, not even in intermediate forms in transition towards permanent farming. Policy is complemented by the regional Alternatives to Slash and Burn (ASB) initiative of the International Centre for Research in Agroforestry (ICRAF), yet with a variety of intermediate steps towards permanent agriculture. The debate may thus one day cease altogether once shifting agriculture becomes a system of the past, as it is already rapidly declining in extent.

1.4 The Thai-German Highland Development Programme

With the onset of highland development in the late 1970s, northern Thailand was divided into spheres of influence of donor-assisted development projects, coordinated by the specially set up Thai Office of Narcotics Control Board (ONCB). This shows the emphasis at the time on drug control, and although other government departments were later included as implementing agencies, ONCB remained the main line agency right till most project were phased out by 1998 (DIRKSEN 1997,333). The Thai-German Highland Development Programme (TG-HDP) was the longest running Regional Rural Development Project (1981-1998), with a multisectoral approach that included:

- Infrastructure; rural roads, household water supply, small-scale irrigation.
- Community development; participatory analyses, planning processes.
- Health services and education; health care, sanitation and basic education.
- Agriculture; opium control, permanent settlement, agricultural and forest zoning, subsistence and cash income, rural finance and marketing.
- Off-farm income; handicrafts, non-wood forest products, ecotourism.
- Human resource development; shift from formal training to participation.

The original project concept of the TG-HDP in 1981 stated that:

"The goal of the Thai-German Highland Development Programme is to devise and implement a strategy to solve, as far as possible, the socio- economic and ecological problems of the three project sites in the northern hills of Thailand…"

This was subsequently modified for its final phase (1995-98) to:

"The quality of life of the highland population is improved, the drug abuse problems are reduced and the ecological balance is maintained better" (ANONYMOUS 1998,vol.1,4).

Shifting cultivation was to be replaced with "*stable agriculture*" (though "*stable"* is a term that was not defined), consisting of cash crops, the conservation of natural resources and the improvement of social services by means of a multidisciplinary work approach. The three project sites of the TG-HDP were (Figure 1-3):

- **Tambon** (sub-district) **Wawi** in Chiang Rai Province; first selected area in 1981 and concluded in 1994.
- **Nam Lang** in Mae Hong Son Province; second project area started in 1983, named after the watershed and upgraded to district in 1996 with the name Pang Ma Pha.
- **Tambon Huai Poo Ling** in Mae Hong Son Province; third project area started in 1990.

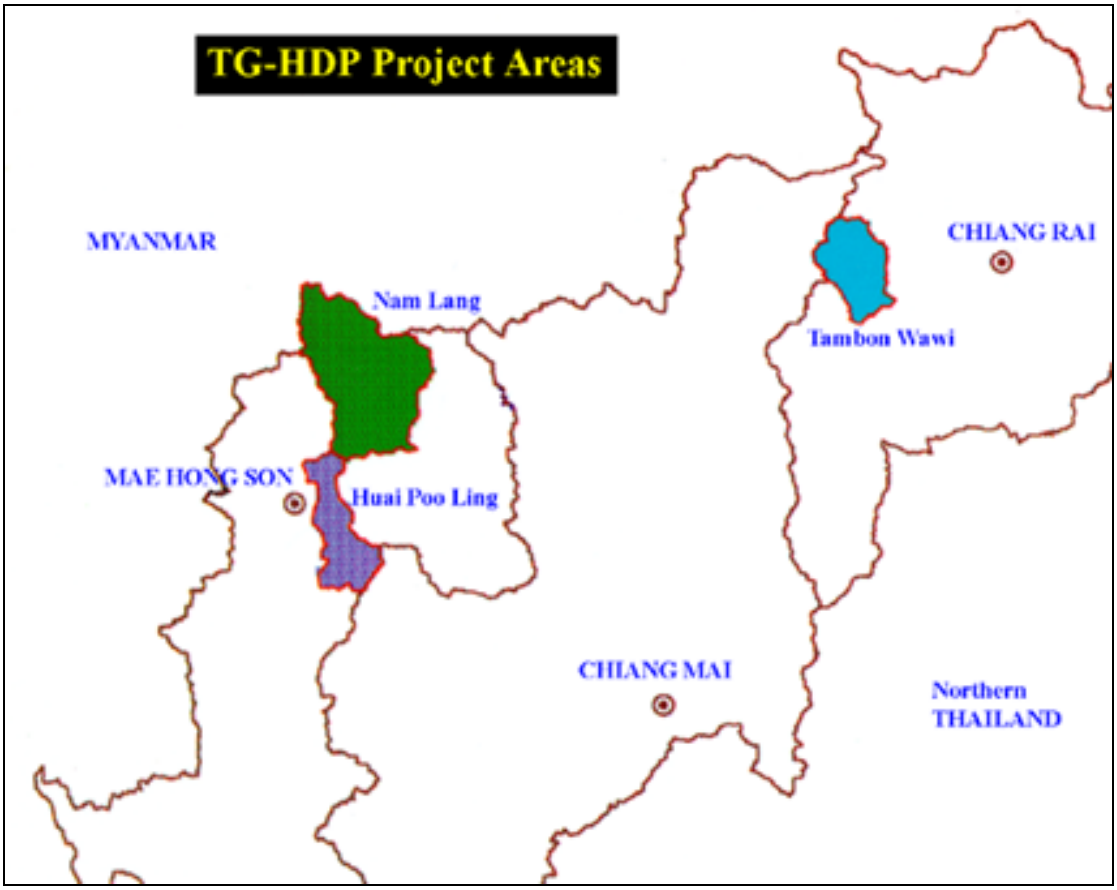


Figure 1-3: TG-HDP project areas in northern Thailand

Like the entire TG-HDP project, the agricultural/forestry component can roughly be categorised into three phases that resemble a trial and error approach in the search for a solution to a complex situation: Crop Substitution or Replacement, Soil and Water Conservation (SWC), and Community based Land use planning and local watershed Management (CLM) as summarised below (ANONYMOUS 1998,vol.1,23).

1.4.1 Crop Replacement (1984-1987)

Following in the footsteps of other projects like the Royal Project (since 1969), the Thai-Australia Highland Agricultural and Social Development Project (TA-HASD, 1980-1993) and CARE Mae Chaem (1983-1994), the first approach employed by the TG-HDP in the agricultural sector was *"crop replacement"* of opium poppy by alternative cash crops such as coffee, passion fruit, red kidney bean and tomatoes. This phase was dominated by the perception that hill tribe shifting cultivation was in *"a vicious circle par excellence"* (SALZER 1987,5) that required an immediate remedy. New crops were introduced via researcher managed demonstration plots, the provision of seeds/seedlings and training given in cultivation techniques. Extension was carried out by government employed field workers. The impact was moderate, as farmers were concerned about maintaining the yields of subsistence crops and, more important, the issue of marketing sustainability had not been sufficiently considered. At first new cash crops were successful, but as the supply increased the prices dropped, and lowland Thais began cultivating the same crops concurrently on lower lying areas with more input facilities and less erosion as well as irrigation constraints, thus outclassing the marginalized hill tribes. This somewhat simplistic approach did not consider the agricultural and marketing complexities prevalent in the highland areas, let alone the indigenous knowledge that had led to the swidden cultivation systems. As this approach proved unsuccessful, the next phase of subsidised soil and water conservation as an alternative package started.

1.4.2 Soil and Water Conservation (1987-1990)

Extension of a Soil and Water Conservation (SWC) package was a means to achieve semi-permanent production from sloping land. Vegetative strips, legume rotation, reduced burning, mulching etc. were the main technical elements demonstrated and extended with project provision of incentives in cash and kind (seeds, seedlings, fertiliser) for both field workers and farmers (ANONYMOUS 1998,vol.1,18). The approach was summarised in a *Highland Agricultural Extension Handbook*, with a complementary socio-economic component of *Modern Thai Highland Communities*. There was rapid adoption of soil and water conservation initially, which dropped off markedly once the subsidies were discontinued. Assessments of the lack of adoption first concentrated on purely economic cost-benefit analysis, which showed that SWC had little economic benefits to farmers (RENAUD 1997,17), while a more detailed study revealed the limits to economic evaluations and called for the consideration of other factors (ENTERS 1992). The SWC package generated so-called "*token lines*" of alley cropping near villages ready for display to government officials who promoted them (ENTERS 1996,423), while elsewhere they were stopped. Similar results in other projects led to more farmer inclusion in extension work (TURKELBOOM et al. 1996; SOMBATPANIT et al. 1993). A very counterproductive method was a shift from positive incentives to negative ones like the threat of resettlement and the confiscation of identity cards by officials (ENTERS 1996,419).

1.4.3 SFS and CLM (1990-1998)

At the end of the SWC phase, adoption rates dropped from 300 (1987-90) to 35 improved plots (1991-92), while in the same period 61 and 75 farmers cancelled SWC respectively (ANONYMOUS 1998,vol.1,19), clearly showing that it was not suitable to local conditions. As a recognition for the need to modify the SWC package, combined with possible resettlement of highlanders by the government, the longest phase of TG-HDP assistance was based more on traditional practices of ethnic groups (ENTERS 1991,26). First a concept of Sustainable Farming Systems (SFS) was introduced in 1990 with optional SWC measures, perennial and annual cash crops, livestock production and small-scale irrigation, thus evolving from a package to a basket of options. A subsequent impact survey stressed the urgent need for more interaction between extension workers and villagers (BOURNE 1992,50). The SFS approach was much more suited to the needs of gradual agricultural diversification and the integration of local technologies (Photo 1-8).

Photo 1-8: Hillside pond for irrigation built by the interpreter on his field

By 1989 the positive effects of the UN-Sam Muen Highland Development Project (SMDP, duration 1987-1994) with its Participatory Land Use Planning (PLP) approach (TAN-KIM-YONG 1993) were exerting their influences on the TG-HDP, and the readiness for a similar approach was assessed in 1989 as:

"Watershed management strategies must be built on highland farmers' existing motivations for sustaining their highland environments through increasing the value, renewability, security, manageability and equity of resources" (MOHNS 1989,42).

Perhaps the fact that the SMDP had RFD as its counterpart agency (the only donor assisted project to do so) was sufficient encouragement to think that controversial forest policies were shifting towards participatory conflict resolution. Thus the SFS approach was expanded to include a shift towards the conservation of natural resources with the aim of full participation of the hill tribe communities through a concept of *"Community based land use planning and local watershed management"* (CLM), initiated in 3 villages in 1990 and which has spread to 30 villages in Mae Hong Son province. The aim was an improved sustainable use of land, water and forests, a rehabilitation of watershed catchment areas and an intensified agricultural production on suitable land. Three-dimensional topographic models became the key visualisation tool, to demarcate highland areas under shifting cultivation, permanent farming, community forest areas and conservation/watershed forest areas for protection (Photo 1-9). The TG-HDP defined the main objective in its CLM guidelines as (BORSY and v. ECKERT, 1995,3):

„The CLM approach should be seen as integrated in the whole process of development, with the focus on people organisation and self-reliance. Sustainability can only be achieved by the land user, and a project, government organisation or implementing agency can only facilitate the process."

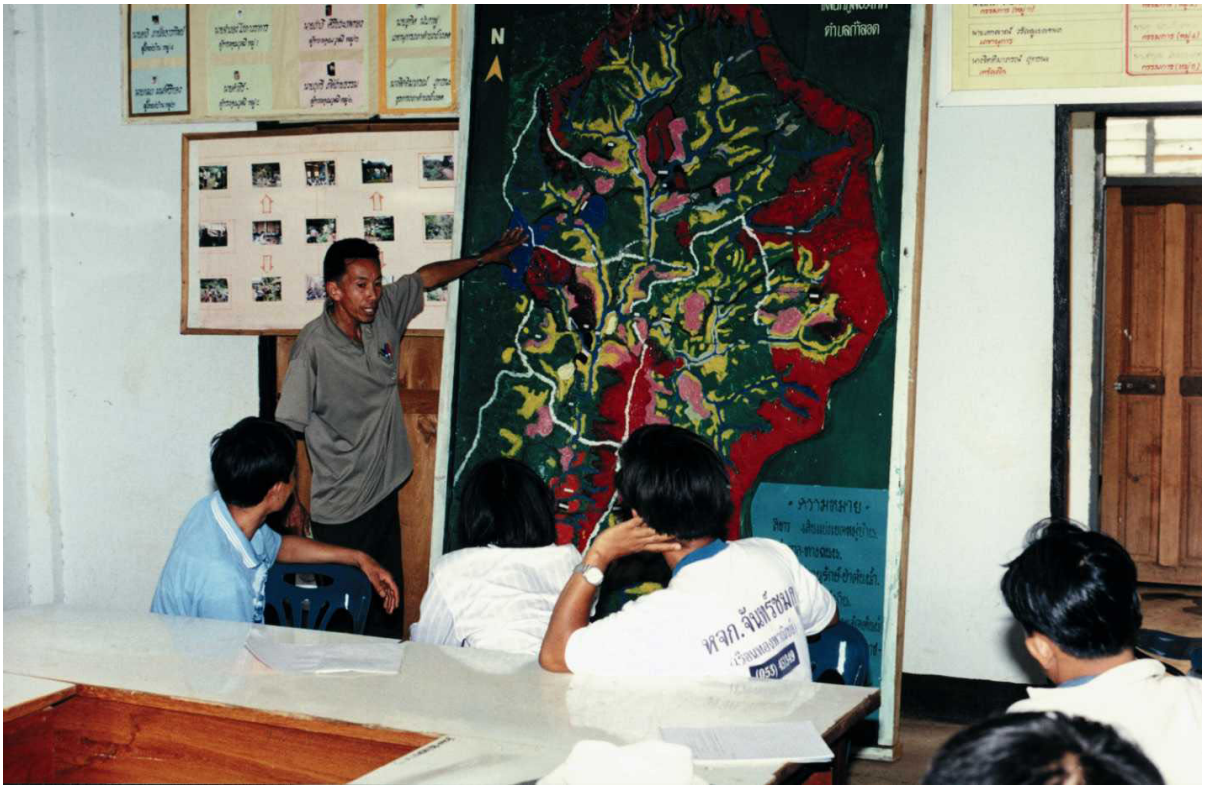


Photo 1-9: TAO Secretary of Tham Lod shows land use to visiting village leaders

The TG-HDP has concentrated the CLM approach in Pang Ma Pha district, and in Huai Poo Ling sub-district (Tambon). Furthermore, "O*uter User Boundaries"* were demarcated beyond which no activities are permitted, and these in turn were meant to be used as village boundaries when the village is officially registered with the Department of Local Administration (DOLA). By mapping the areas on land use maps

to a scale of 1:8,000 and displaying this information on three-dimensional land use models made of cardboard or styrofoam, it was possible to measure areas and display land use to outsiders at the same time (Box 1-1 and 1-2). This could then be used as a basis for discussion to increase the size of conservation areas and demonstrate to government authorities that villagers can manage and protect forests themselves. The whole participatory planning approach was meant to operate via Land Use Planning Teams (LUPT) from various implementing agencies as a holistic, though slightly idealised, process (v. ECKERT 1993,26).

Box 1-1: Steps in land use planning (ANONYMOUS 1998,vol.1,30)

Preparation of base maps from ONCB 1:8,000 aerial photos.

Land capability classification maps prepared mainly on the basis of slope steepness and soil conditions. Capability classes:

1. Annual cropping: < 35 % slope, > 30cm soil depth
2. Perennial cropping: < 60 % slope, > 15cm soil depth
3. Unsuitable for permanent cropping: > 60 % slope or shallow soils
4. Remnant natural forest
5. Susceptible areas: landslides, gullies, stream banks etc.

Provision of arable land for permanent cultivation and off-farm resources (pasture, forest areas).

Identification of future access roads.

Box 1-2: Steps in CLM implementation (ANONYMOUS 1998,vol.1,31)

Monitor present land use; enter land use onto topographic model and later onto baseline map.

Identify problems and conflicts; villager discussions resulting in indications which land is suitable/unsuitable for different uses.

Planning of land use changes and local watershed management measures; based on the optimisation of land use facilitated by government officials.

Implementation of local watershed management measures; a community self-help activity with minimum assistance from government agencies.

Identification of an *"outer-user-boundary";* delineation of an area most suitable and needed for the villagers' permanent use.

Reviews of the CLM approach in 1993 (v. ECKERT), 1995 (BORSY and v. ECKERT) and 1998 (ANONYMOUS) pointed out problems of farmers' adoption of the approach and difficulties encountered by the planning teams. Villagers were seeking to achieve lands use rights, opposed the outer user boundary and felt that insufficient attention was paid to their priorities, while the participatory approach was hindered by top-down attitudes of officials and the absence of forestry officials at planning meetings. This was attributed to the inappropriate watershed classification coupled with insecurity of land use rights and perceived as not conducive to planning team – community interaction (ANONYMOUS 1998,vol.1,33). An additional factor weakening participatory land use planning was the government policy of village relocation out of protected forest areas, and the TG-HDP formulated a warning of its consequences (ANONYMOUS 1994). Nevertheless, the inhibiting effects of a controversial policy framework were not taken seriously enough and not clearly identified as the main stumbling block to the operation of the Land Use Planning Teams, perhaps out of diplomacy so as not to offend government agencies.

The TG-HDP then moved away from land use planning based on land capability and watershed classification to what it called "*Area Approaches*", in response to controversial village boundaries and conflicts over land allocation. Problems with forestry officials were acknowledged and a direct access to the target group was favoured (Box 1-3). In the final phase (1995-1998), the TG-HDP focused on the aggregation of land use data at Tambon level and on the support of the Pang Ma Pha Hill Tribe Network Organisation, which emerged from attempts to resolve conflicts between three neighbouring villages over the collection and sale of forest products in 1996 (JANTAKAD 1998,vol.2,54).

Box 1-3: Factors leading to CLM "area approaches" (ANONYMOUS 1998,vol.1,21)

Permanent village settlement had led to the need for recognition of community land boundaries.
Increasing conflicts between neighbouring communities on land allocation recognition and use.
Conflicts between villagers and the Royal Forest Department (RFD) over definitions of forest and agricultural areas.
The need to consider linking production and conservation, particularly in mini- or micro-watershed areas.
Increased recognition of indigenous resource management systems, such as those practiced by the Karen or Lua ethnic groups.
Increasing use of participatory working approaches.

The final assessment of the CLM approach stated (JANTAKAD and CARSON 1998,8):

- *"Rules and regulations for the management of the natural resources have been created and strictly followed by villagers, especially with regards to the harvesting of forest products and watershed protection;*
- *The Tambon and network organization situated in the same watershed area or sharing similar resources, have improved their management capabilities;*
- *The integration of traditions and cultural practices related to natural resource conservation, such as tree ordination, has increased the level of community involvement."*

The experiences of the TG-HDP have shown that a land use planning approach based on land capability in combination with hill tribe priorities, in spite of the absence of a clear legal framework, can be successful to a certain extent, yet unresolved policy issues will endure beyond the lifetime of a project. The situation may be compared to the effects of a "*Project Model*" (VAN DAM 2000,13), whereby a project usually responds to a particular way of looking at reality and knowledge that is often perceived differently by the target group it is working with. Reality often only exists as long as it relates to the project, with little flexibility to readjust objectives according to external changes, such as an attempted watershed management without modifying the main counterpart agency to include other organisations besides the ONCB with its focus on drug control. The same can be said about local counterpart organisations in relation to forestry. Trees are often seen as isolated from the rest of nature and farming systems, so that a holistic view of trees as part of a larger livelihood system is missing. Project periods are fixed and are imposed on communities that have little to do with their notion of time. As important as participatory methods may be, they are also part of a larger power relationship between different actors, and in this context national policies will prevail over well-intended project interventions.

1.5 Problem situation and thesis structure

1.5.1 Stakeholders and development priorities

The controversies over the negative environmental impacts of shifting cultivation reflect the different perceptions of hill tribes (as the primary stakeholders) and government agencies with mandates to administer the highlands. As for hill tribe priorities, it is useful to look at the main problems in TG-HDP project areas (ANONYMOUS, 1998,vol.1,51):

- Inadequate nutrition;
- Low cash income;
- Food crop production below self-sufficiency level;
- Insufficient livestock production;
- Shortage of land and no land security.

Another project examined the importance of erosion in relation to other farming problems, and weeds as well as insects were mentioned as more urgent problems than erosion, though soil conservation is practised if perceived as a threat to livelihood (TURKELBOOM et al. 1996,77). In other areas, measures to avoid erosion included an increased frequency of cultivation of flatter slopes rather than steep slopes (FORSYTH 1996,385; DURNO 1996,6). This means that hill tribes are first looking for food sufficiency and land security to meet their subsistence needs as well as village registration in order to gain access to government support, prior to modifying their traditional farming systems.

On the government side, after an initial focus on opium suppression from the 1970s to the 1990s, three divergent policies regarding forest settlement and farming have evolved:

- The restoration of forest cover to 25 % conservation and 15 % production forest by the Royal Forest Department (AMORNSANGUANSIN 1992). All land is categorised by a watershed classification, which placed most highland areas under watershed class 1A, thereby outlawing any farming or settlement (TANGTHAM 1992,5). For Mae Hong Son province this covers 64 % or most of the higher lying areas (RFD 1997,3).
- The official registration of hill tribe villages by the Department of Local Administration (DOLA) under the Ministry of Interior, classified by population and long-term residence without migration, progressing from *satellite villages* with no official status to official *key villages* with recognised village leaders (AGUETTANT 1996,58).
- The classification of highland villages according to permanent agricultural potential, carried out by the Department of Land Development (RTG 1997), though insufficiently coordinated with the Royal Forest Department (RFD) regarding watershed classification and the inclusion of hill tribe land classification.

The large number of donor-supported projects had at least some influence on policies. These include the First Master Plan for Highland Development and Narcotic Crops Control (1992-1996), as well as a Second one (1997-2001), a Thai Forestry Sector Master Plan (RFD 1993) that was never implemented due to a lack of participation of key stakeholders (JANTAKAD and GILMOUR 1999,98), a Community Forestry Act debated since 1991 (though not yet passed by Parliament), and the Tambon Administrative Organisation Act in 1995 (NELSON 2000,5). A step forward in the resolution of forest settlement were the cabinet resolutions of 19, 22 and 29 April 1997, which allowed villagers who had been living in forests prior to 1993 to remain there on the condition that they take part in forest conservation (EKACHAI 1998,11). These three resolutions suddenly created an openness, in that hill tribe villagers revealed their extent of land use in the renewed hope for land security, while forestry officials became more open towards community forestry as their protective mandate was softened. Unfortunately, policy decisions are short-lived in

unstable political conditions, and on 30 June 1998 the three resolutions were cancelled (JANCHITFAH and CHINVARAKORN 1998,2). On the positive side, the current national five-year plan encourages participation (NESDB 1997,109):

"Local people and community organisations should be urged to play an increasingly active role in the management of natural resources and the environment."

The application of the plan reveals gaps between national policy targets and criteria for implementation at local level, particularly for forest protection and settlement. There are national reforestation targets, but these have not been defined at district or sub-district level, nor is there a process for their implementation. This also extends to the agricultural classification of highland villages in the sense that the communities themselves are not involved. To help deal with such confusing and inequitable treatment, hill tribes have often sought support for their issues from the wide range of foreign-funded highland development programmes – which peaked with a total of 168 organisations, supported by 49 international donors (GANJANAPAN 1997,205). The resulting situation for hill tribes resembles a struggle for a *"Land Deal",* in the sense that they have to gradually reduce the forest areas for periodic cultivation to shorter fallow periods on lesser numbers of fields. Parallel to this they have begun to adopt agroforestry systems and plant cash crops to meet their livelihood needs. In exchange, such modifications are tolerated or officially recognised by government agencies up to the point of permanent settlement, and the government provides extension support for general infrastructure. This situation is highly volatile and subject to change depending on who is in power, so that farmers still have no security on which to base their land use decisions.

The problem complex has thus evolved from the mere application of forest protection laws and planning for agricultural intensification to a multidimensional one calling for mediation and conflict resolution to overcome two sets of congruent dichotomies:

1. **Forest protection and agricultural sustainability**
2. **Centralised policy definition and local implementation**

The highlands of northern Thailand are therefore a prime example for a contradictory situation arising when a centralised government system with conflicting interests of forest preservation and social integration of ethnic minorities extends its control to the remote areas, where traditional shifting cultivation practices clash with centralised planning. The range of issues indicates that forest degradation and natural resource management in Thailand are complex and highly political, particularly when focussing on the highlands. In order to simplify and stratify the problem analysis, it may be helpful to differentiate the interlinked problematic issues into distinct problem categories as suggested by NAGEL and FIEGE (1998,11) in their concept of Action and Development oriented Research (ADR):

a) "The problem at target-group level (societal problem);

b) The problem of an organisation, e.g. a development project at whose instigation the study is being carried through (organisation-related problem);

c) The information problem (i.e. the information deficit, - this may also be a methodological deficit), which is to be solved by means of the field project (knowledge problem)."

The above dichotomies may further be subdivided into problem complexes that can apply to more than one problem level. The assignment to problem levels in brackets is purely based on the author's perception and is not a universal classification:

- **Environmental problems**: land degradation, loss of biodiversity, erosion, fire, logging (target group and information problem);
- **Agricultural/livelihood problems**: soil fertility decline, food shortages, restricted access to land, opium cultivation (target group and organisational problem);

- **Policy/institutional problems**; contradictory mandates, no link between national and local level, land security, community forestry illegal, (organisational problem);
- **Data availability and its use in land use planning**: inaccurate and outdated maps, actual land use not included, no data at village and sub-district level in presentable and understandable form (information and organisational problem).

1.5.2 Structure of this thesis

With a consideration for the multitude and intensity of development initiatives that taken place in northern Thailand, this thesis applies land use planning theory at communal level with the TG-HDP as a case study. The rapidly changing farming systems of the hill tribes are linked with the policy environment in order to assess their impact on the participatory CLM approach and to identify remaining key controversial issues to be overcome under the current process of decentralisation. The following structure was therefore selected:

Chapter 1 is an overview of the complex livelihood systems in the highlands, a description of the TG-HDP and the identification of main problem areas.

Chapter 2 is a review of land use planning theory and tools in general, with possible applications to the highlands of Thailand.

Chapter 3 presents the research framework and gives an overview of the research methodology for this specific case.

Chapter 4 summarises the changing policy framework and institutional setting.

Chapter 5 presents planning results for individual villages, but also assesses informal and formal developments at higher level like the Hill Tribe Network and Tambon (sub-district) for planning.

Chapter 6 analyses remaining key planning issues at village and sub-district level and reviews the methods employed, followed by a proposed planning approach.

Chapter 7 draws conclusions of the research.

2 Evolution of land use planning theory

In order to assess to what extent land use planning can deal with the complex set of problems in the highlands of northern Thailand, it is useful to give an overview of how it evolved from a technical science to gradually include social aspects and more recently the participation of local people. An overview of some planning tools gives the range of means of assessment, followed by institutional planning systems that also show how they are embedded and influenced by the respective policy framework. The chapter ends with a note of caution regarding limitations of land use planning and extracts some particular issues pertinent to this case study in Thailand.

2.1 The establishment of land use planning as a science

Land use planning has evolved in stages, starting with land valuation for purposes of yield estimates and later taxation of crop quantity as well as quality. Then aspects of soil evaluation were included, first with individual estimates and later scientific analysis of soil composition, with more recent considerations of spatial aspects and socio-economic criteria. The most recent approach has become a participatory one involving local land users with their own criteria. This latest development was particularly due to the rapid population increase last century from 1.6 billion in 1900 to now more than 6 billion, revealing the increasing necessity for mutually agreed land use to avoid conflicts over natural resources. These issues have even been formulated at policy level with a global outlook under the concept of "*Sustainable Development*" in Agenda 21 or the blueprint for development in the next century. Agenda 21 aims to redress the balance between resource exploitation and environmental conservation after centuries of unlimited resource use, to which Thailand is also a signatory, expressed as (AGENDA 21,1992):

"Sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs".

The lengthy document is divided into sections covering a wide range of issues, and in the "*land cluster*" section, planning even received its own chapter, thus underlining the importance for coordinated and careful approaches to land management (10:1):

"Expanding human requirements and economic activities are placing ever increasing pressures on land resources, creating competition and conflicts and resulting in suboptimal use of both land and land resources. If, in the future, human requirements are to be met in a sustainable manner, it is now essential to resolve these conflicts and move towards more effective and efficient use of land and its natural resources. Integrated physical and land-use planning and management are an eminently practical way to achieve this."

2.1.1 Origins of land valuation and spatial aspects

From the earliest days of agriculture some 10,000 years ago farmers have thought about how to use their land as well as how to maintain it for future harvests (PRETTY 1995,26). The gradual establishment of permanent structures of settlement together with population growth have modified nature, via intermediate stages of shifting cultivation and fallow systems, towards systems of permanent cultivation, and humans have slowly converted more and more of the earth's forests into permanent farmland. As groups of settlers have come into contact with others, land soon became an issue of conflict, since the availability of natural resources was inevitably linked to securing one's own survival and power over other peoples. The history of colonialism is the best example of the excesses of unlimited human subjugation. The accumulation of land became a question of social status and power, and stratified societies developed systems of land valuation as well as social ranking according to ownership of land, with labourers to work the land, particularly in feudal societies by means of taxation.

Some of the oldest written records of land valuation date back to the ancient Egyptian cultures, who developed simple forms of cadastral surveys in which property boundaries were recorded annually in books in relation to the Nile floods, and taxes were collected based on yields (AMLER 1992,19). In China, the 2000-year-old "*Guanzi-Diyuanpian"* book classifies land by soil types and their potential for agricultural productivity. In Greece, around 600 BC, the people were divided into four classes according to the land capability of the fields they owned. The Roman Empire had various methods to value land, all linked to taxation in the form of 10 % of the harvest, and later modifications included criteria such as topographic and agricultural aspects. Permanent crops like grape and oil fruits, as well as flat areas were taxed more than annual crops and steep land. There were also cultures that did not develop systems of individual land ownership, and according to their philosophy land was only borrowed from nature for a period of time. This was the case practised by North American Indians, even in cultures that had been farming for 1,500 years like the Anasazi and Hopi (PRETTY 1995,45).

It is difficult to pinpoint the beginning of land use planning as a scientific discipline, but early attempts of land valuation for taxation have gradually been refined and stratified according to soil colour and soil type into various categories in East Prussia and Russia in the 18th century (AMLER 1992,21). As Russia advanced to the main wheat-exporting nation, soil quality for this crop was studied and soil terminology like chernozem, podsol or gley became established in modern soil type terminology. In Germany, the first attempts to develop objective land classification criteria were undertaken at the beginning of the 19th century (THAER 1813; quoted by AMLER 1992,21), by dividing crop land into 10 classes based on soil characteristics like soil type, humus and lime content, as well as yields. These were further developed into scientific criteria with the understanding of soil formation processes and the explanation of soil fertility. As the understanding of physical and chemical soil formation processes evolved, there was a need to create a link with economic assessments, which were first applied by the precursors of the land suitability classification in 1899 in the USA in a national programme to map, characterise and interpret soils. The US Soil Survey established references for the main land use types and soils were classified according to their relative economic importance.

Apart from the physical aspects of land valuation, spatial aspects were also gradually included. According to AMLER (1992,25), the first important concepts of spatial planning date back to the 17th and 18th century for the areas of forest and agricultural zonation in Russia and France. In France during the Age of Absolutism, structural planning under Napoleon placed a lot of emphasis on landscape management, as land and agriculture were considered the backbone of wealth. There were similar concepts by the German Heinrich von Thünen in 1826, who introduced the economic factors of distance between production and consumption centres in concentric circles of land categories around a city centre. This implies that natural conditions such as soil and climate are uniform parameters, and that spatial differentiations are based on economic influences only, without considerations for other factors.

In the 20th century, communal administration in Western Europe led to more differentiated planning concepts between cities and the countryside, a precursor to regional planning. The first settlement planning law was enacted in England in 1909 *("Housing and Town Planning Act*"), while the *"Town and Country Planning Act"* of 1947 included more aspects of land use (AMLER 1992,28). In 1946 in England the first monograph was published that combined land evaluation with applications to land use planning. In Eastern Europe the Soviet Union developed the GOERLO-Plan in 1920 as the first territorial plan (SCHOLZ 1980,272), though it concentrated on electrification and industrialisation. In the USA the first law on land use planning was passed in Wisconsin in 1933 (MCALLISTER 1973,23), which demarcated areas for forests, recreation and agriculture as well as areas without any land use regulations. The plan was a result of severe economic recession combined with the consequences of unregulated logging and forest fires, as well as low taxation morale.

2.1.2 The first system: The USDA land capability classification

A big step forward in the scientific development of land use planning was based on a human induced natural disaster - the *Great Dustbowl,* which struck the southern and south-western states of Oklahoma, Arkansas, Kansas, Colorado, Texas and New Mexico during the 1930s in the USA. In the early years of

the 20th century, farmers were encouraged to expand westwards by favourable homestead policies and the high price of wheat. The land was settled at an alarming speed and in 1919 alone, some 4.5 million ha of grassland were ploughed for the first time to grow wheat. The thoughtless rapid conversion of land for wheat cultivation led to 50 million ha of farmland severely affected by erosion (PRETTY 1995,45). Dust and earth blanketed houses and crops, and the landscape had become a vast desert with shifting dunes of sand where there had once been crops. Farmers had caused a massive land degradation that almost led to the collapse of civilisation in the Midwest. As a reaction, the Federal Soil Conservation Service was established in 1935 to conduct a national inventory of erosion and was a precursor to modern extension services. But more important for land use planning was the fact that the limitations to production imposed by soil and climatic conditions were taken more seriously, resulting in the first Land Capability Classification (BALDWIN; KELLOGG; THORP 1938,979; quoted from: EUROCONSULT 1989,111) by the US Department of Agriculture (USDA), in order to avoid an overuse of land beyond its abilities to regenerate. This approach has gained international recognition and is now applied to land use planning worldwide.

The modern Land Capability Classification evolved into a categorisation primarily on the basis of its capability to produce common cultivated crops and pasture plants without causing land degradation over a long period of time. It is a hierarchic system divided into eight capability classes, with respective subunits of capability subclass, capability unit and soil mapping unit as the smallest unit of area measurement, expressed in soil series (KLINGEBIEL and MONTGOMERY 1961,1-4; quoted from AMLER 1992,148). The better a land unit is, the more variable is its potential for use.

2.1.3 A global system: The FAO framework for land evaluation

Based on a general dissatisfaction with land evaluation based on soil productivity alone, institutions attempted to formulate a globally applicable framework in the 1970s. A methodological approach was developed that could be refined according to specific countries, and resulted in the FAO "*Framework for Land Evaluation*" (FAO 1976). The main idea is the suitability assessment of different land uses for a given location. These were then subdivided into guidelines for rain-fed agriculture in 1983, forestry in 1984, irrigated agriculture in 1985, and extensive grazing in 1991 (FAO 1995,81), but not yet for mountainous areas. At this stage in the evolution of land use planning, interactions between types of land use and the technology level have been included.

The procedure for land evaluation identifies land use types, determines water, nutrient and erosion control requirements, maps land units to describe their physical properties and compares the requirements for land use types with land properties to arrive at a land suitability classification (FAO 1993,37). FAO distinguishes between three levels of detail when assessing land; namely a reconnaissance scale (1:500,000 - 1:120,000), a semi-detailed scale (1:100,000 - 1:30,000) and a detailed scale (1:25,000 - 1:10,000). In terms of spatial references, FAO uses homogenous "*land mapping units*" based on land or soil types. AMLER (1992,165) points out that FAO leaves open the valuation of assessment factors as well contents, meaning that there are no objective differences between relative importances of suitability assessments. Land evaluation is either of qualitative or quantitative nature, where the latter is particularly important for economic surveys.

The FAO has also started to classify Agro-Ecological Zones (AEZ) in order to develop an overview of production potentials. The methodology used was innovative in that it characterised tracts of land by quantified information on climate, soils and other physical factors, which are used to predict the potential productivity for various crops according to their specific environmental and management needs. Agro-ecological zones are defined, which have similar combinations of climate and soil characteristics, and similar physical potentials for agricultural production, as part of FAO procedures (FAO 1995,10):

"Agro-ecological zoning is a subdivision of the rural lands on the basis of physical and biological characteristics (climate, soils, terrain forms, land cover, and to a degree the water resources), and is used as a tool for agricultural land use planning."

The results of land suitability are a set of land suitability classes for crops grown on different land units with specified level of inputs (Figure 2-1). Each land suitability class for each crop under each input level reflects a range of anticipated yields, mapped on a scale of 1:5 million. Production estimates can be made for defined agro-ecological zones or by administrative units like province or district.

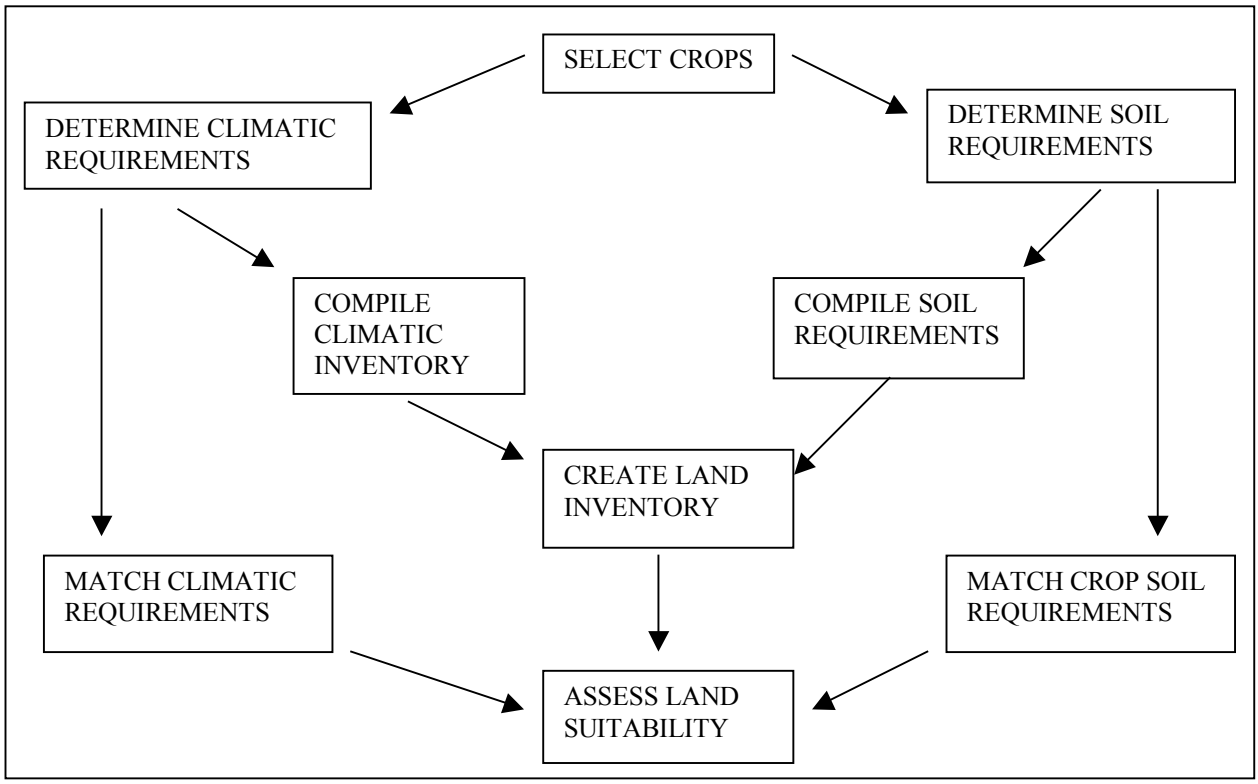


Figure 2-1: Methodology of the AEZ approach (after FAO 1995)

Apart from the biophysical parameters pertinent to land use planning, the FAO has also recognised the need to include people in a planning framework, thereby expanding approaches to socio-economic factors. For a successful integration of physical features and people, FAO has even proposed the inclusion in computerised databases, for which two major components are necessary (FAO 1995,26):

1. A methodology consisting of a set of reproducible procedures undertaken in sequence, which results in the transformation of information on physical, economic and social factors into higher incomes based on sustainable land use.
2. An institutional framework, which is structured and staffed in such a way that it is able to implement these procedures successfully.

In order to achieve this FAO propagates the development of a decision support system that is scale independent and can be used at national or farm level (Figure 2-2). It is interesting to point out that FAO propagates a purely computerised system, which in many tropical countries would not be available and could therefore not be maintained.FAO proposes a multiple goal analysis and optimisation techniques for the data, since there is usually more than one objective when negotiations take place on land resources management. They may be to a greater or lesser extent incompatible, but they can often be ranked in order of priority. Objectives must be identified before *"best"* or *"optimum*" can be defined in relation to land use, yet their relative importance can alter over time. This reduces the value of printed suitability maps as interim outputs, and enhances the value of a computerised system that can rapidly access, combine, and reclassify the basic data as required. It is possible to conduct local level land use or farm planning by ranking objectives in order of priority, but true multiple objective maximisation can only be done subjectively or through linear programming or other mathematical methods.

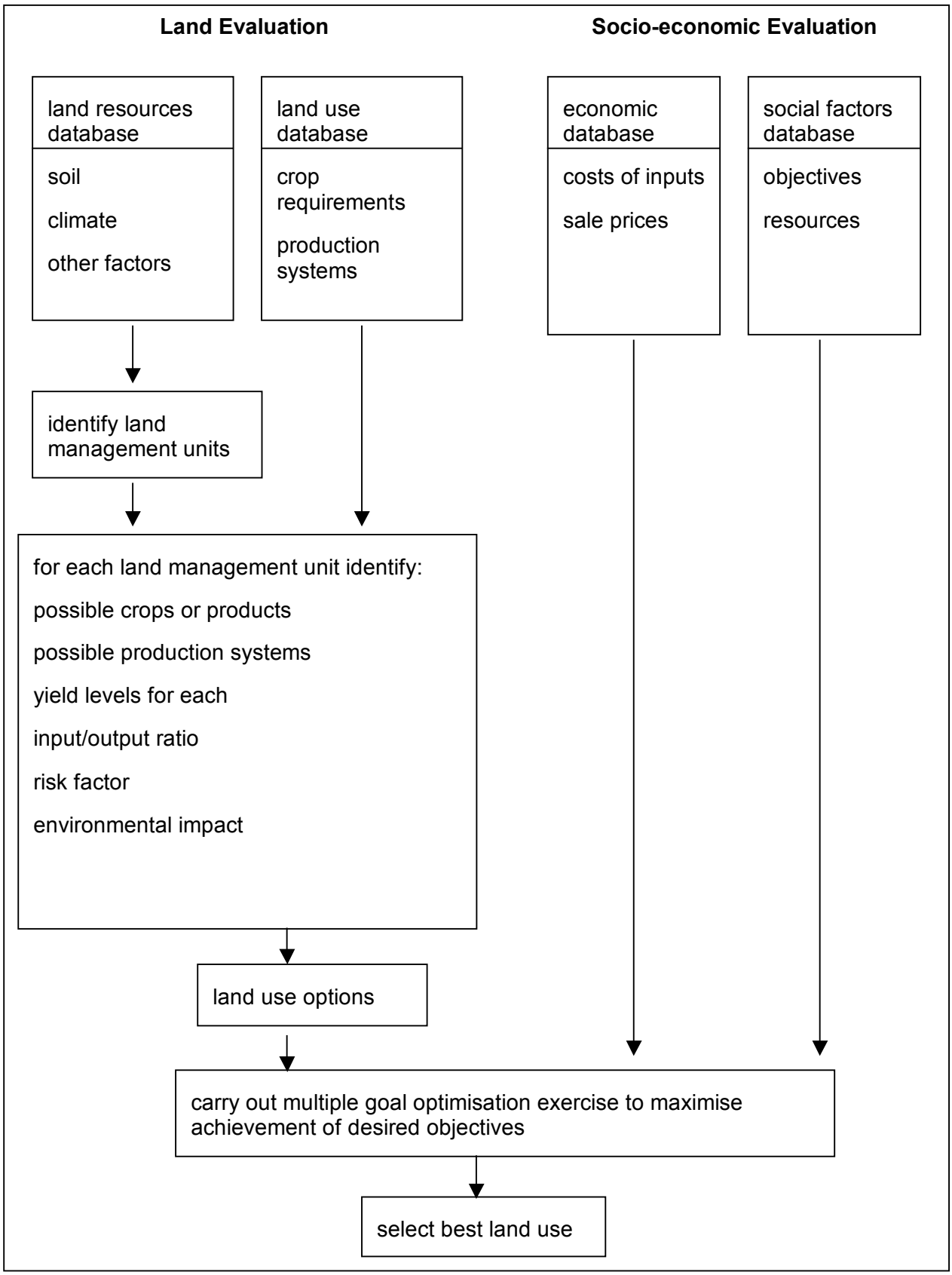


Figure 2-2: Decision support system for land use planning (after FAO, 1995,27)

The FAO methodological framework includes socio-economic factors, but does not specify how these are to be incorporated into planning. This shows that while there are data and procedures for the assessment of biophysical features in the left half of the diagram, the assessment in the right half is fairly empty. It also indicates that social and ecological factors are very difficult to assess objectively or integrate into a database, as important as they may be. The negotiation and decision-making process is often long drawn-out, partly because of conflicting needs and demands for land and also because land use options as well as constraints become clearer to participants. To strengthen and speed up a common understanding, the result of each successive optimisation should be available to planners and land users for their respective sets of objectives and constraints until a consensus or compromise plan is achieved. While the FAO approach is an attempt to unify all relevant factors in one database, it is unsuitable for planning at local level, as it would be impossible to include all aspects relevant to villages. Hence alternatives have to be considered to reflect the farming environment of rural communities.

2.1.4 Planning with people: Participation

After the initial successes of yield increases achieved by the Green Revolution of the 1960s, the hopes that poverty would be eradicated in the world did not materialise and scientists started to examine the causes. Step by step the target group started to be considered as an active participant in planning with the advent of Farming Systems Research (FSR) in the 1970s (see AMLER 1992,222; PRETTY 1995,41). The integration of participation in development research is based upon a democratic understanding of society, and it therefore deals with the political level that is interrelated with the theory of decision. Participation has been defined as (NAGEL et al. 1992,14):

"A process by which all participants (rural men and women, extension agents and management, as well as researchers) are involved in reaching a common goal. The participatory process focuses on mutual decision finding with regard to analysis, planning, implementation, and evaluation of the development efforts."

A number of new approaches were developed to assess rural livelihoods, problems and ways to overcome them, known collectively as Rapid Rural Appraisal (RRA). The origins of RRA, a social science approach for a quick understanding by outsiders of rural life and conditions, can be traced back to the late 1970s and was mainly developed by tropical countries. The South urged a change in perception and approaches to development, guided by these motivations (CHAMBERS 1994a,956):

- Dissatisfaction with the anti-poverty biases of "*rural development tourism*", meaning a brief rural visit by the urban-based professional. These biases were spatial (near cities, roadsides), project focused (only where projects operated and with funding), personal (meeting more men than women, elites and service users), seasonal (more visits in dry and cool weather) and diplomatic (outsiders rarely deal with difficult issues);
- A disillusion with questionnaire surveys, which were long and on a large scale, difficult to process, inaccurate and unreliable in their data, and often ignored;
- A quest for more cost-effective methods of learning and the realisation that rural people are knowledgeable on many subjects touching their lives. This Indigenous Technical Knowledge (ITK) was perceived to have richness and value.

As with any new development, techniques had to be tested and there was a lot of criticism from traditionalists. After some trial years with successes, the situation changed in the 1980s and RRA gained increasing acceptance, also at institutional level. One of the key institutions is the University of Khon Kaen, a world leader in developing theory and methods, which held an international conference on Rapid Rural Appraisal in 1985 (KKU 1987). This helped the spread of RRA to other countries, and the International Institute for Environment and Development (IIED) in London helped to spread RRA worldwide as a complimentary approach for rural development and research (CHAMBERS 1994a,957).

An overview of different types of participation is given below (Table 2-1):

Table 2-1: A typology of participation (after PRETTY et al. 1995,61)

Typology	Characteristics of each type
Passive participation	People participate by being told what is going to happen or has already happened. It is a unilateral announcement by an administration or project management without listening to people's responses. The information being shared belongs only to external professionals.
Participation in information giving	People participate by answering questions posed by extractive researchers using questionnaire surveys or similar approaches. People do not have the opportunity to influence proceedings, as the findings of the research are neither shared nor crosschecked.
Participation by consultation	People participate by being consulted, and external people listen to views. These external professionals define both problems and solutions, and may modify these in the light of people's responses. Such a consultative process does not concede any share in decision-making, and professionals are under no obligation to take on board people's views.
Participation for material incentives	People participate by providing resources like labour in return for food, cash or other material incentives. Much on-farm research falls in this category, as farmers provide the fields but are not involved in the experimentation or the process of learning. It is common to see this called participation, yet people have no stake in prolonging activities when the incentives end.
Functional participation	People participate by forming groups to meet predetermined objectives related to the project, which can involve the promotion of externally initiated social organisation. Such involvement does not tend to be at early stages of project cycles or planning, but rather after major decisions have been made. These institutions tend to be dependent on external initiators and facilitators, but may become self-dependent.
Interactive participation	People participate in joint analysis, which leads to action plans and the formation of new local institutions or the strengthening of existing ones. It tends to involve interdisciplinary methodologies that seek multiple perspectives and make use of systematic and structured learning processes. These groups take control over local decisions, and so people have a stake in maintaining structures or practices.
Self-mobilisation	People participate by taking initiatives independent of external institutions to change systems. They develop contacts with external institutions for resources and technical advice they need, but retain control over how resources are used. Such self-initiated mobilisation and collective action may or may not challenge existing inequitable distributions of wealth and power.

The goals of participation in planning are summarised as follows (PREUSS 1994,116):

- *"Reducing the planners' information deficit concerning the wishes and targets of the population through their participation in the planning, thus increasing the chance of the success of the planned project;*
- *Informing those affected by the plans of government and private institutions through timely disclosure allowing possible resistance to be voiced early enough;*
- *Controlling of institutions which plan and implement these plans by affected groups;*
- *Integrating groups of the population during the different phases of planning, implementation and impact assessment achieving a higher legitimisation of the planned action;*
- *Mobilising parts of the population to take over components of the measures."*

As the idea of participation gradually gained more importance in rural development, it also affected rural appraisal, and *"participatory RRA"* became one type besides others like exploratory RRA, topical RRA and monitoring RRA (CHAMBERS 1994a,957). The beginning of subsequent parallel developments in Kenya and India in 1988 led to the new term *"Participatory Rural Appraisal"* (PRA) in 1991, and the methods usually spread South-South, meaning directly between tropical countries and without the influence of northern nations. A comparison of RRA and PRA helps to understand the evolution (Table 2-2), which is a continuum from RRA to PRA with a shift towards local people.

Table 2-2: A comparison of RRA and PRA (by CHAMBERS 1994a,958)

Key characteristics	Rapid Rural Appraisal	Participatory Rural Appraisal
Period of development	Late 1970s, 1980s	Late 1980s, 1990s
Major innovators based	In Universities	In NGOs
Main users at first	Aid agencies, universities	NGOs, Government field organisations
Key resource earlier undervalued	Local people's knowledge	Local people's analytical capabilities
Main innovations	Methods, team management	Behaviour, experimental training
Predominant mode	Elicitive, extractive	Facilitating, participatory
Ideal objectives	Learning by outsiders	Empowerment of local people
Longer term outcomes	Plans, project publications	Sustainable local action and institutions

2.2 The focus of land use planning

2.2.1 Land users

Land users were originally people living on the land, yet the increasing stratifications in human history led to administrations that gradually owned and/or managed the land. Land was thus used by farmers directly and indirectly, by land owners or government administrations, and recently the term „*stakeholder*" was created to include all actors directly or indirectly involved, defined as follows (GRIMBLE et AL. 1995,4):

„Stakeholders include all those who affect, and/or are affected by, the policies, decisions, and actions of the system; they can be individuals, communities, social groups or institutions of any size, aggregation or level in society. The term thus includes policy-makers, planners and administrators in government and other organisations, as well as commercial and subsistence user groups."

There is a distinction between *primary stakeholders* as those people whose livelihood depends directly on the use of land (farmers, individual title deed holders, landless people and migrants, original inhabitants) and *secondary stakeholders* who are affected by land use changes or administer the area (the community, urban communities, NGOs, district, state, provincial or national governments). FAO (1995,16) assumes that poor farmers have only short-term objectives in order to meet the needs of their families, while the wider community up to national level have more long-term goals with more complexity, yet this perception may be just the opposite. Conflicts often occur when development priorities of secondary stakeholders often overrule or ignore those of primary ones.

2.2.2 Definition of land use planning

Since the inclusion of people and their cultural contexts in planning, perceptions changed from people as mere target groups for implementation to include them as partners, as the FAO (1993,1) definition reads:

"Land use planning means the systematic assessment of land and water potential, alternatives for land use and economic and social conditions in order to select and adopt the best land-use options. Its purpose is to select and put into practice those land uses that will best meet the needs of the people while safeguarding resources for the future. All kinds of rural land use are involved: agriculture, pastoralism, forestry, wildlife conservation and tourism. Planning also provides guidance in cases of conflict between rural land use and urban or industrial expansion, by indicating which areas of land are most valuable under rural use."

In order to spread the concept within its own development projects, GTZ has produced guidelines specifically targeted towards technical co-operation (GTZ 1995,5):

"Land use planning in technical co-operation is an iterative process based on the dialogue between all of the actors involved. Its objectives are the commitment to decisions on the sustainable use of land in rural areas and the initiation and support of the corresponding measures for implementation."

The FAO definition is more scientific in that it focuses on a systematic assessment of natural resources prior to the formulation of recommendations. For GTZ as a development agency this is the task of national agencies, and it sees itself as a facilitator between national institutions and local land users. Both definitions stress the need for dialogue to achieve sustainability as outlined in Agenda 21 and aim to bring together different views:

- **Rational planning system**: a technical approach of resource valuation and economic profitability combined with an optimal planning instrument leads to an optimal problem resolution. This top-down approach leaves out social factors and conflicts;
- **Social basis for conflict resolution**: planning becomes a political process in which power structures determine the outcome, as different groups with differing interests come together. Mechanisms of conflict resolution as well as consensus building are the most important factors (participatory approach).

The technical approach has dominated land use planning in the past with varying degrees of success, whereas the very democratic social basis for conflict resolution has only recently been acknowledged as important in addressing social and environmental problems. An integrated approach incorporating rational and social considerations seems the most appropriate to address the driving forces in planning, i.e. the need for change, the need for improved management or the need for a different pattern of land use dictated by changing circumstances. According to the FAO (1993,1), two conditions must be met if planning is to be useful:

1. **The need for changes in land use, or action to prevent some unwanted change, must be accepted by the people involved;**
2. **There must be the political will and ability to put the plan into effect.**

According to FAO (1995,14), the process of land use planning and its implementation hinges on three elements: the stakeholders, the quality or limitations of each component of the land unit, and the viable land use options in the area. In a more technical sense the factors of planning are: the amount of land available and its tenure; the quality, potential productivity and suitability of the land; the level of technology used to exploit the land resources, the population density, and the needs and standards of living of the people. Each of these factors interacts with the others.

2.2.3 Goals of land use planning

FAO divides the goals of planning according to Agenda 21, namely efficiency, equity and acceptability, and sustainability, while GTZ (1995,7) summarises these into:

"Land use planning creates preconditions for the achievement of sustainable, socially and environmentally tolerable, culturally wanted and economically meaningful land use. Social processes of decision making and consensus are started for areas in private, communal or public use and their protection."

Efficiency; Development planning considers economic viability, which can be achieved by an efficient and productive use of the land. Here it is important to distinguish between individual and government efficiency. Individual efficiency means the greatest return on capital and labour invested or seeking the greatest benefit from the area available, while government efficiency is more complex as many interests have to be considered.

Equity and Acceptability; Land use must be socially acceptable, though it is very difficult to determine criteria for that. The general goals are food security, employment and a security of income in rural areas. Land improvements and redistribution may reduce the inequality between people, yet this depends on who sets the goals, and effects of redistribution have to be considered by planners. Ideally, the target group should participate in the development of measures that are wanted, accepted, supported and implemented. Social and cultural appropriateness are key factors for the acceptance of measures, as well as technically and economically suitable approaches.

Sustainability; Generally one has to strike a balance between production and conservation, a conflict of satisfying needs of people and the preservation of the environment on which the production depends, ideally resulting in local land uses that are sustainable. FAO (1995,18) admits that the systematic assessment of sustainability of current or planned land uses is in its infancy. A community that destroys its land forfeits its future with devastating consequences (see *Great Dustbowl* Chapter 2.1.2).

2.2.4 Watershed management

Closely related to land use planning is the concept of watershed management, which is the larger ecological unit affected by land use and considers land use planning as a part of watershed management (KLEMM 1996,18). Initially, watershed management was seen purely in terms of forestry for the restoration of the Alps, not in relation to agriculture, and the emphasis was on nature conservation without a regular use of resources. Yet in situations of shifting agriculture in forest areas, watershed management and agriculture can occur simultaneously as stated by FAO (1991,1):

"In the developing countries, watersheds (and particularly those located relatively near to important downstream resources) are often inhabited by large and increasing human and animal populations. Most of the people living in these watershed areas are struggling to survive owing to limited resources."

Watershed planning and land use planning consider the same environmental issues, but from differing viewpoints and levels of detail (FAO 1991,3). A land use planning decision for a site specific development can influence many watershed management issues. Watershed and subwatershed studies do not determine land use; instead these plans establish constraints, opportunities and approaches for input into land use planning decisions. A watershed is a coherent geographical unit covering the whole area from which water drains into a river, from its source to its mouth. There are no clear definitions yet in terms of scale or size for a watershed, so it lies between a river basin (all the land contributing water to a river system, from the headwaters to the river mouth) and a catchment (a small area contributing water to a specific stream). Watershed management has also changed from a focus on geo-physical features to the inclusion of socio-economic conditions of people in rural areas (ICIMOD 1998):

"Watershed Management is an iterative process of integrated decision-making regarding uses and modifications of lands and waters within a watershed. This process provides a chance for stakeholders to balance diverse goals and uses for environmental resources, and to consider how their cumulative actions may affect long-term sustainability of these resources."

The effective management of watersheds as entities is essential to ensure that activities in one part do not adversely affect others downstream. Watershed management is concerned with sustainable development based on the use of the natural resources and incorporates conservation practices to maintain natural vegetative cover to help control erosion, reduce sedimentation and downstream flooding by regulating stream flow. Conflicts over land use within watersheds are growing for the same reasons in that pressing demands for land for agriculture, forestry, grazing and wildlife have degraded their natural resources. Frequently there are many agencies responsible for the management of watersheds and they are often overstretched and uncoordinated in their work, lacking information and authority to function effectively. Effective watershed management assists stakeholders to evaluate the potential and limitations of these land resources and to resolve conflicting issues that arise during their exploitation.

The experience of land use planning projects in Asian countries shows that watersheds are too large in size for planning at local level (GTZ 1996,66):

"In the past, many land use planning exercises were based on the watershed as a geographical unit. Several local communities might be affected at the same time, some more than others, and some only partly. Experience has shown that such a planning approach will rarely be adopted. The local population has to be actively involved in any land use planning process, and the entire area used by a given group needs to be considered. The area affected by the land use plans needs to be based on socio-economic units, rather than landscapes."

This thesis therefore focuses on land use planning as the lower and more detailed level of natural resource management that can deal with issues at village level as a socio-economic unit, yet the work approaches can be aggregated at higher levels and possibly also extrapolated to watershed management.

2.3 Tools for land use planning and means of survey

2.3.1 Geo-physical features and remote sensing

Aerial photographs

Aerial photographs are used in geodesy for their quantitative, topographic information and as photo-interpretation for more qualitative information. When projecting three-dimensional objects onto two-dimensional planes, it is important to perform photogrammetric restitution in order to restore points distorted on a photo to their correct map positions (EUROCONSULT 1989,188-206). For this purpose a second photograph is taken of the same area from a different position, and both photos are placed under a stereoscope in order to obtain a three-dimensional effect. Thereby series of pictures are taken consisting of parallel strips, giving an overlap in two consecutive photographs (60-65 %) and a side lap between adjacent strips (20-25 %). Photographs can range from a scale of 1:1,000 to 1:5,000 for detailed surveys (crop studies, game counts) to 1:35,000 to 1:70,000 for reconnaissance surveys (roads, land classification). The more detailed the pictures, the more are necessary to cover an area.

Aerial photographs are increasingly employed in land use planning to resolve conflicts over boundaries between villages, and according to GROTEN (1997,12) it is possible to:

- *"Improve the whole population's knowledge of the village's land, for instance among the women, who often know only parts of the territory well;*
- *Become better acquainted with resource limitations;*
- *Stimulate a sense of responsibility for managing resources and identify potential conflicts."*

Yet at the same time aerial photography entails several problems. Photographs are often difficult to obtain, for instance on account of military secrecy, poor cartographic infrastructure or inadequate budgets. Local

people tend to mistrust cartography as they suspect taxation or land reform, so their successful use depends on the political framework conditions. Particularly in Thailand only very old photographs are available and new flights would be very expensive.

Satellite imagery

Satellite photographs are hardly practical for participatory village planning as they are on a large scale of 1:100,000 to 1:200,000, are quite expensive (GROTEN 1997,13) and in the case of Thailand difficult to obtain for border areas. An overview of this tool is provided in GTZ (1991) with further comments on the high level of expertise and equipment necessary to work with them.

Geographic Positioning System (GPS)

Closely linked to satellite images is the Global Positioning System (GPS), which sends regular radio waves to fixed satellites in orbit and uses these to compute the exact co-ordinates of the position of the instrument. By walking along an area, it is possible to record the co-ordinates and thus determine the boundary as well as the size of a field. More advanced equipment has an interface with a computer so that the data can be transferred for further processing into maps. In combination with remote sensing, maps can therefore reflect the real situation fairly accurately. There are, however, some disadvantages when using GPS according to BORSY and van ECKERT (1995,10):

- *"It is a time-consuming method;*
- *The accuracy is influenced by poor satellite coverage and thick forest cover;*
- *A GPS for land use planning needs to be combined with a computer, on its own it is not very useful."*

Geographic Information Systems (GIS)

Whereas the above three tools are purely extractive in the kind of information they gather, a Geographic Information System (GIS) may come closest to suitability for an integrated approach with local people. Over the past decade, the technology of Geographic Information Systems (GIS) has developed so rapidly that it is increasingly used in development planning (GTZ 1996,52). A GIS consists of various components, starting with the incorporation of geographical data from remote sensing sources or maps and is then converted into a computer-readable form. This data can be manipulated and different data themes such as land cover and soil types can be overlaid for analytical operations. The results can then be disseminated to relevant stakeholders, mostly in the form of maps. The various computer programmes that have been developed can more easily be linked with satellite images and GPS for data acquisition and presentation. The data are available in the form of maps, statistics and tables, though these have often been compiled at different formats and scales. Such spatial inconsistencies have made their integration for the decision-making process of resource management difficult and time-consuming in the past, but here too there are improvements (FAO 1995,30):

"The development of Land Information Systems (LIS) and Geographic Information Systems (GIS) software has enabled the available georeferenced databases to be harnessed with relative ease into multiple-layer digital form. Each thematic layer is analogous to a map, but it can be both displayed and printed separately, and overlaid to produce a multi-theme map at any scale or orientation."

According to FAO, multidisciplinary natural resources teams composed of geographers, agronomists, geostatisticians, computer programmers, economists and social scientists are required to make GIS/LIS systems an effective tool in support of land use planning. Data extensionists are also needed to ensure that the system is transparent to users such as policy-makers and stakeholders at every level. In a modern computerised GIS, each separate piece of data or information stored in a database is

georeferenced. This means that its exact geographical location is also entered into the database, either as a point reference or as a polygon or mapping unit. The GIS system has the capability to retrieve all the information and a given subject to display it, or hold it as a separate thematic layer, which can be overlaid, viewed or printed out.

Yet FAO also points out some limitations to the use of GIS technology (FAO 1995,31):

1. *"The inadequate analysis of real-life problems as they occur in complex land management and sustainability issues at the household level, and as they involve the integration of biophysical, socio-economic and political considerations in a truly holistic manner;*
2. *The limitation in data availability and data quality at all scales, especially those that require substantial ground truthing;*
3. *The lack of common data exchange formats and protocol;*
4. *The inadequate communication means between computer systems, data suppliers and users due, for instance, to poor local telephone networks."*

So far the access to GIS has been limited to few high-level decision makers, but in future it will give local people more access to quantitative and qualitative data, and enable them to influence policy decisions more. As was found by an interdisciplinary group of researchers, a common ground between GIS and participatory diagramming is that both provide visual information relevant to the people who created it (ABBOT et al. 1998,30). The advantage of a GIS is that information can be presented to policy-makers in a form and at a scale that is usable, and may therefore seem more objective than participatory surveys or diagrams. Additionally, an immense volume of data including local information can be processed, which can serve to integrate isolated information sources, aid in conflict resolution over land, and can thus help in the consolidation and sharing of ideas. In terms of participation and local interests, a GIS can become even more important when scaling up local concerns and priorities in relation to regional goals and plans. By opening up an exclusive product, community involvement in planning can be enhanced.

On the other hand, shared and accessible information is only as good as local politics, meaning that there are also drawbacks to a participatory GIS as summarised from ABBOTT et al. (1998,32) and project experience by GTZ (1996,55) in Asia:

- The hardware and software like satellite images and copyrights are expensive;
- A constant power supply is a problem, particularly during the rainy season when power may be cut for the whole day;
- The administration of a GIS requires a high level of technical expertise, thus often making GIS an *"expert system";*
- There are often problems in obtaining updated materials such as maps and field data. These satellite images and aerial photos are essential in order to produce accurate maps. Fearing criticism, many users prefer to keep their data to themselves and so sharing information with others is not always that easy;
- It is difficult to include the richness of local detail when scaling up;
- The display of village location and agricultural fields may be used by authorities to raise more taxes or even confiscate land, a rather counterproductive effect.

2.3.2 Participatory assessment tools

Participatory assessments and means of survey have been influenced by a whole range of rural research and include activist participatory research, agroecosystem analysis (developed by Chiang Mai University),

applied anthropology and farming systems field research (PREUSS 1994). The key concepts shared by Rapid Rural Appraisal (RRA) and Participatory Rural Appraisal (PRA) have been summarised (Table 2-3). The rapid spread of RRA and PRA methods, behaviour and attitudes, and sharing has had a great impact on development research and work, thus elevating the role of local people to a more collaborative partner. The spread of PRA, in contrast to most government programmes that are spread vertically and from the top-down (e.g. the Training and Visit system for agricultural extension), has spread more laterally, personally and experiential. According to CHAMBERS (1994c,1440), the four modes of spread have been through field learning experience (village experiences), a light touch (brief workshops), by villagers (within and to neighbouring villages), and through dissemination materials. The information and insights gained from PRA have often been diverse, detailed, complex, accurate, interesting and shared in a short time.

Table 2-3: Key concepts shared by RRA and PRA (from CHAMBERS 1994b,1254-1255; SCHÖNHUTH and KIEVELITZ 1994,7-12):

Idea or concept	Purpose
Reversal of learning	Researchers learn from and with the local community on the site and thus gain an insight into local physical, technical and social knowledge. This involves staying in the homes of local residents and taking part in daily activities.
Triangulation	A form of *"cross-checking"* by varying the team composition, the sources of information and the techniques applied. Each phenomenon should be illuminated from various points of view, and often diversity is considered as more important than standardisation.
Optimal ignorance and appropriate imprecision	A balance between the necessary precision, quantity of data and timeliness in relation to what can be left out or what need not be measured, with the idea that it is better to be approximately right than precisely wrong.
Sequencing	A combination of instruments in a step-wise manner. For land use planning this could be aerial photographs of the project region to sketch simple maps showing land units. Followed by field observations to verify information, and in a third step residents are questioned to supplement local place names and other relevant information. This is followed by joint transect walks through the area to discuss the distribution of important resources with residents.
Visual sharing	In contrast to extractive questionnaires where the information becomes the *"property"* of the interviewer, a joint mapping or modelling project allows everyone to contribute and follow the process. The use of three-dimensional topographic models is an ideal tool for resource mapping, and villagers can easily explain their environment to outsiders such as government officials.
Follow-up meetings	Models and maps made jointly on-site are well suited for documentation and reflection, as well as for the implementation of proposals. It is important to have regular follow-up meetings to include modifications, particularly during difficult negotiations with government agencies.

The myriad of methods can be grouped into three headings of visualised analyses, interviewing and sampling methods, as well as group and team dynamics methods as done by PRETTY et al. (1995,72) or simply listed like in CHAMBERS (1994a,959-961) or SCHÖNHUTH and KIEVELITZ (1994, 75-106), as they overlap anyway:

Handing over the stick: this should encourage researchers to get to know people, let them teach you, use their own criteria to look at issues, learn from errors and give them confidence. Basically it means: sit down, listen do not interrupt.

Secondary data review: these include files, reports, maps, aerial photographs, satellite imagery, and books as well as unofficial or *"grey literature".* These should be reviewed and summarised with copies of

maps at the beginning of surveys prior to village visits for background information.

Key informants: these people are identified through discussions or participatory social mapping and can give outsiders an entry point into the village world. Key critical areas in villages can also be found this way in terms of livelihood or erosion.

Semi-structured interviews: these constitute the single most important instrument in RRA and to a lesser extent in PRA, and include a mental or written checklist, yet at the same time being open-ended and following the unexpected. They can be community, group, key informant, individual and chains of interviews depending on their purpose.

Direct observation: involves the intensive and systematic capturing of observable phenomena and processes in their natural surrounding. Results should be crosschecked with key informants to verify their correctness (triangulation). Tape recordings, notebooks and cameras should only be used with the consent of the local people. The data is systematically ordered and presented in transects and seasonal calendars.

Do-it-yourself: asking to be taught includes trying things like transplanting, ploughing, weeding and wood collection. Apart from the fact that one learns to appreciate the difficulty of these tasks, the laughter due to mistakes and clumsiness of researchers ploughing with an ox can break barriers and establish closer contact.

Participatory diagramming and modelling: in RRA this is the most important technique after semi-structured interviews, and is also used in PRA. Local people use the ground, floor or paper to make social, demographic, health and natural resources maps or topographic models to display their environment. Diagrams include transects (cross-sectional maps of village areas from e.g. north to south), seasonal calendars showing for e.g. peak rainfall and labour periods, timelines to note important events like founding of a village or extensive droughts, social mapping to illustrate the structure of a village, Venn diagrams showing links between key institutions and their relative importance by circle size, and topographic scale models to enable the community to take part in decision-making processes as well as for conflict resolution.

Ranking and scoring techniques: these are analytical instruments for the study of important problems and preferences, and can even capture hard data such as incomes of wealthy villagers. Preference rankings can be used to quickly identify problem areas or favourite foods. Matrix scoring can be used to assess different qualities of crops by giving values ranging from 1 (well-suited) to 5 (poorly suited). Wealth can be ranked the same way and is one of the most successful types of ranking.

Indigenous knowledge: local classifications are often more precise than terms used by outsiders. The use of local categories facilitates a dialogue and joint elaboration of appropriate solutions. Closely linked are local beliefs and ethnobiographies that strongly influence the daily activities of rural people. Here the ability to communicate in the local language becomes particularly important, as ideas are lost in translation.

Analysis of difference: differences of gender, social group, occupation and age are important for an understanding of the range of issues. The most important area has become gender analysis for different social roles, yet different perceptions according to age are particularly crucial in rapidly changing societies.

Joint evaluation and presentation of results: results are presented in writing, orally or visually. The most commonly used mode is graphical depiction using symbols or pictures. Public meetings present, analyse and correct the results of the PRA and can lead to jointly elaborated recommendations for future activities. A more modern variation includes theatre, songs or videos, where case histories can be portrayed.

Yet a rapid spread has also brought some dangers, for at first PRA was rejected by academics and higher-level government decision makers, though gradual changes have made it a more acceptable approach to development. The remaining concerns now do not stem from rejection but from rapid or rigid adoption (CHAMBERS 1994c,1441):

1. ***"Instant fashion":*** RRA and PRA are vulnerable to discreditation by an over rapid promotion, followed by misuse and sticking to labels without substance. Development professionals may use them merely as a façade. Another misperception is that PRAs are simple and easy quick fixes, which they are not.

2. **Rushing**: during early stages, quick alternatives to long learning and large-scale questionnaire surveys were sought, so the word *"rapid"* was included in the new term. This has been used to justify brash and biased rural development tourism (brief visits), which combined with an insensitivity to social context and a lack of commitment led to the same situation as before: the poorest are not seen, listened to nor learnt from. To avoid this danger, care, patience and plenty of time are crucial, so the word *"relaxed"* may seem more appropriate.
3. **Formalism**: this may prove to be the most difficult problem, as innovations are standardised and manuals tend to become longer with time. Manuals can inhibit and classroom training can become very long, thereby losing spontaneity. Instead one should learn in the field through experience and allow mistakes.
4. **Routinisation:** with scaling up and spread, repetition develops regular habits. There are many ways of carrying out RRAs and PRAs, yet practitioners have tended to slip into standard practices, thereby overlooking other options. Some routinisation is inevitable, but innovation and creativity are needed.

Participatory means of assessment and survey should not be seen as a new approach to replace established methods, but instead as complimentary to better understand the rural environment and to develop solutions appropriate to farmers' problems. As villagers are not removed from a wider environment, planning processes need to link up with the policy framework and institutional environment.

2.4 Policy framework and institutional set-up

2.4.1 Centralised top-down and participatory bottom-up planning

The various technical and participatory elements of land use planning are of course not removed from the political framework conditions and administrative set-up prevalent in countries, and these can be great stumbling blocks if the political will for planning is missing or there is no legalisation or security of user rights. A generalised land use planning approach has to be adapted to and integrated into a prevalent political and administrative system, alternatively also known as framework conditions. The issue of planning approaches has become more and more important and has been examined under seemingly opposed centralised *top-down planning* and participatory *bottom-up planning*, influenced by the increasing orientation to local needs and people that began in the 1980s (CHAMBERS 1994a,953). Particularly in the Asian context this has generated a rethinking process among foreign funded development programmes that led to a workshop in 1993 in Sri Lanka to exchange experiences (BETKE 1994,131). The discussion focused on framework conditions, administrative levels, political systems and to what extent participation is a concept pushed by western countries as *"good governance*".

Top-down planning

The classic or traditional model of top-down planning places the state as the administrator of the environment, and the state makes all decisions about resource utilisation. This makes land use planning an instrument of governmental guidance and control, closely linked to national development plans. Development potentials are assessed for all regions and goals set for all administrative levels, while monitoring is purely an assessment of goal achievement. This approach was particularly widespread in Indonesia in the National Land Agency and Sri Lanka in the Land Use Planning Division (BETKE 1994,133).

Bottom-up planning

The opposite term is bottom-up planning initiated at the local level and involves the active participation by

the local community. It is a reaction to the inability of the government to have the role of a public administrator of natural resources at the local level. The aim of the community at village or one level higher is the development of local (communal and private) planning and implementing capacities in natural resource management (BETKE 1994,133). The experience and knowledge of land users and technical staff are mobilised to select development priorities and to formulate implementation plans. In terms of actors at the local level and responsible administrators, there are a great variety of institutions. Reference is made to now defunct Community Based Land Use Planning and Local Watershed Management Committees in Thailand within the context of the TG-HDP (BETKE 1994,134), which shows that this idea was important, but perhaps not realistic under a contradictory policy framework. At a higher district level, reference is also made to District Land Use Planning Teams with the aim to conduct planning in the form of a participatory dialogue. At the local level, Non-Governmental Organisations (NGOs) are recommended as faster acting, less bureaucratic and more flexible actors, who are often given the role of neutral negotiators between the government and local people.

Through the integration of local land users in the planning and decision making process, it is attempted to improve the quality of planning results by upgrading villagers to resource persons with valuable local knowledge. Additionally, it is expected that participation increases the acceptance of planning measures. This implies responsibility or local ownership of decisions, by which villagers consider issues as their own and will be more interested in resolving them. In the long term this process leads to a better understanding of administrative structures and the presentation of local problems to outsiders. Yet it also implies a democratic process, for villagers will demand their rights too. A summary of advantages and disadvantages of *"bottom-up"* planning is given by FAO (Table 2-4).

Table 2-4: Advantage and disadvantage of bottom-up planning (after FAO 1993,7)

Advantage	Disadvantage
Local targets are set where the benefits and management are seen as the peoples' own, enhancing implementation	Limited technical knowledge at the local level means that agencies need to make big investments in time and labour
More popular awareness of land use problems and opportunities	Local interests are not always the same as regional or national ones
Pays attention to local constraints, both for natural resources and socio-economics	Difficulties of integrating local plans within a wider framework
Better information is fed upwards for higher levels of planning	Local efforts may collapse due to a lack of higher-level support or even obstruction

2.4.2 Planning systems and administrative levels

Parts of a planning system

The competition for natural resources leads to conflicts, whereby farmers usually lose to companies and administrations, there is thus a need to co-ordinate between stakeholders. Government agencies and development projects often intervene to overcome these problems, leading to formulations within certain framework of planning level with respective goals. Several considerations regarding the parts and social contexts of planning systems according to GTZ (1995,19-26) are given below:

- Different planning types: sector or technical plans as opposed to cross-sectoral or integrative planning, depending on the goals of what is to be achieved;
- Planning norms: based on the ethical values of societies and include participation, conflict resolution or natural resource management;

- Definition of responsibilities: administrative levels (nation, region or district) and organisations (sectoral like an agricultural ministry or territorial like a council);
- Rules or relations between different planning types: vertical linkages between planning levels and horizontal linkages between technical and integrative planning;
- *"Playing rules"*: participation of target groups and their representation at higher administrative levels, and the identification of mechanisms for conflict resolution.

Given these general considerations, GTZ then identifies the social context of systems. Central systems are characterised by clear command lines from top to bottom, where lower levels implement orders from above, though a problem here is the lack of flexibility. Decentralised systems have certain responsibilities and partial budget autonomy at lower levels, where regional or local particulars are considered, yet complexity lowers efficiency. Heterogeneous systems have modern techniques at higher levels of planning, while lower levels have different and sometimes contradictory mechanisms, often resulting in a lack of co-ordination between levels.

Administrative levels

According to FAO (1993,6), land-use planning can be applied at three broad levels: national, district and local. Different kinds of decisions are made at each level, yet each one has a land-use strategy, policies for planning priorities, projects that tackle priorities and operational planning for implementation. The greater the interaction between levels, the better, so that the information flow is bi-directional (Figure 2-3).

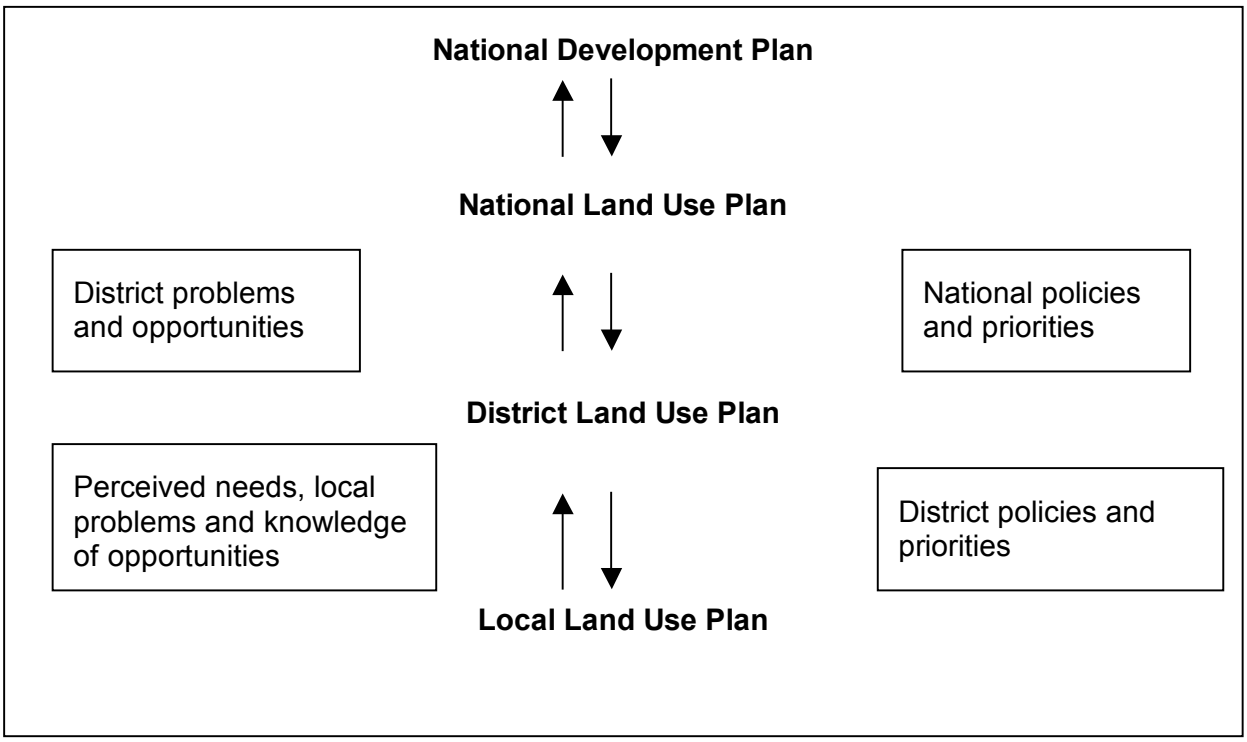


Figure 2-3: Two-way links between planning levels (after FAO 1993,6)

At **national level** the allocation of resources for the whole country are at stake, which often involves priority setting for district-level projects covering land use policy (competing demands on land for food production, export crops, tourism, housing etc.). Other aspects include national development plans and budgets for development projects, coordination between the various agencies involved in land use and

finally, legislation of land tenure issues, forest clearance and water rights. National goals are a complex matter, as the policy decisions affect many people and decision makers are not specialists in all fields, which is why FAO points out various institutions to enhance planning (FAO 1995,34):

- National resource planning committee: It is important to have the necessary qualities of technical knowledge, access to resources and authority in the form of a permanent, inter-ministerial technical committee, in order to identify priorities, allocate resources, approve plans and monitor implementation. Decisions are in the form of recommendations to the cabinet or decision-making body of the country.
- Natural resources conservation board or commission**:** This should be a legally independent body enforcing laws and policies as well as proposing new ones;
- Ministries and departments: Their function is seen as providers of information and implementation. Overlapping or poorly defined mandates are major causes of inefficiency with often conflicting interests.

The **district level** includes all land areas that fall between national and local projects (FAO 1993,7), yet natural units such as watersheds are not mentioned. This is an intermediate stage between national and local levels in the assessment of the diversity of the land. Issues to be resolved include the siting of developments like settlements and forest plantations, improved infrastructure like water supply, roads etc., and the development of management guidelines for improved land use. At regional or district level FAO (1995,34) identified provincial or district land use planning with the aim of priority setting, resource allocation, approval and monitoring of sub-national plans including implementation monitoring, with a mixed membership of community and government.

The **local level** may be the village, group or small catchment. At this level it is easiest to fit plans to the needs of local people using their knowledge and contributions. Looking at it from another perspective, this may be the first level of planning that includes priorities drawn up by the local people such as the layout of irrigation and soil conservation, the design of infrastructure like village roads, and the location of specific crops on suitable land. Here FAO avoids a definition of a body that would be imposed on existing community groups (FAO 1995,34), since the freedom to debate is considered essential. This indicates that till recently the local level was not considered important in planning structures, yet with increasing decentralisation this is changing. This is particularly relevant for Thailand after the legislation for decentralisation was passed in 1995 that declared the sub-district the lowest level of government representation. New committees with elected village leaders are gradually set up throughout the country and will increasingly have the role of an interface between the government and local communities.

Actors in land use planning

Land use planning is done by many actors working together (FAO 1993,9) with advice, mediation and conflict resolution as key challenges for the planning team (Figure 2-4). The composition of the planning team is left open to individual situations, and in the case of the TG-HDP it was intended to consist of project staff, village leaders and representatives of key government agencies like forestry and land development (BORSY and v. ECKERT 1995,10), based on the assumption by FAO that there was the political will to put the plan into effect (FAO 1993,1). Land users are people either living in the planned area or whose livelihood depends on wholly or partly on the land, such as farmers, foresters or indirectly sawmills and crop processing. The involvement of all land users in planning is essential and yet their experience is often neglected, yet there is no success without the support of local leaders. Decision makers are responsible for putting the plans into effect and operate at different levels. The planning team provides information and expert advice, while the decision-makers guide the planning team on different issues and select the best options, which are ideally exposed in a transparent manner.

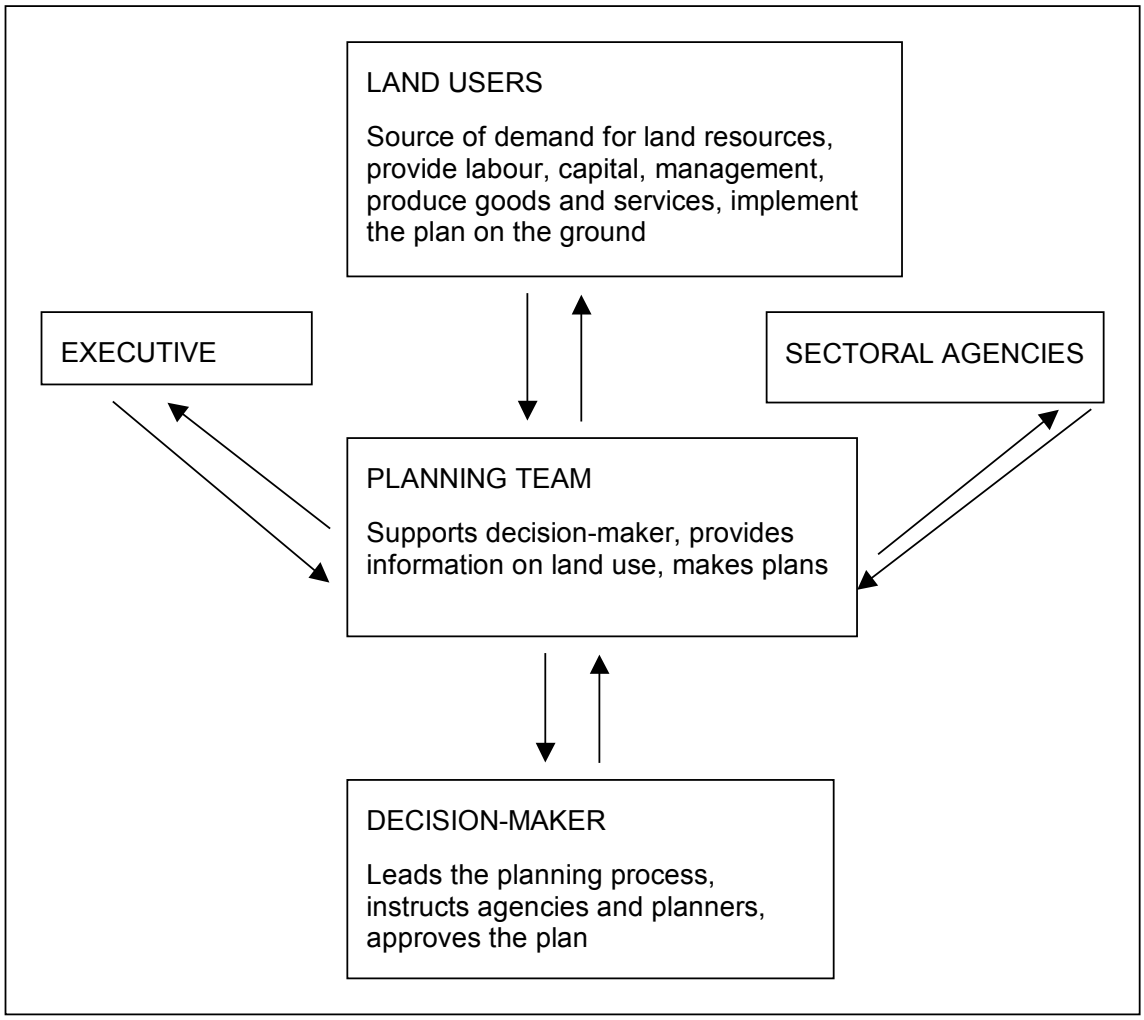


Figure 2-4: Various actors in the planning process (after FAO 1993,9)

2.4.3 The planning process

Given the importance of participation by local people as a concept, it then needs to be linked to land use planning in a practicable form for implementation. It is important to find out the local knowledge of land management in order to make planning positive, as mere regulations to prevent people doing what they do now are bound to fail. Local acceptability of changes is best achieved by local participation. GTZ has formulated 11 principles of participatory land use planning (GTZ 1995,8):

1. Orientation to local conditions, methods and contents. A lot of planning fails due to uncritical applications of global models, contents have to focus on local conditions;
2. Cultural conditions are considered and local knowledge is used. Rural societies have a complex local knowledge that needs to be part of appropriate resource use;
3. Traditional problem and conflict resolution strategies are considered;
4. A concept of development as a process carried from *„the bottom“* and based on self-help and self-responsibility. Popular participation in planning can only be sustainable if one plans with the people, not besides or against them;
5. A dialogue that creates conditions for co-operation of actors. All stakeholders have to voice their interests and goals to lead to co-ordinated decisions. It is important to identify participant groups and to differentiate according to their role in resource use;

6. A process that improves the planning and action competence of participants. A participatory approach at all steps promotes technical and organisational abilities;
7. Transparency and free access to information for all participants. Transparency increases the willingness and ability to plan and decide, and raises the motivation. Decisions in consensus can thus be reached more easily;
8. Target group differentiation and gender approach. Interests are assessed with locals in a decision process, where men and women have different resource access;
9. Interdisciplinary co-operation. Ecology, economics, technical, financial and socio-cultural dimensions of land use require an interdisciplinary approach;
10. An iterative process with flexible reaction to changed conditions. There is no one-time planning document, iteration is rather a basic principle and method;
11. Implementation oriented. Consideration on how decisions are to be implemented.

Although GTZ (1995 and 1996) and FAO (1995) both emphasise the need to include local needs in planning, there are few indications on how this is done in practice. A few key issues are pointed out by BETKE (1994,137) as follows:

- **The district as an interface between the state and society**; The debate on decentralisation is quite advanced in Asia, yet the district as turning point for the information flow between the local and higher planning levels has been undervalued. In Thailand the sub-district or Tambon may evolve as the key interface in future, and it therefore needs to receive appropriate financial and personnel capacities. Yet this requires a co-ordination of sector agencies at ministerial level to overcome conflicting interests that will translate into a lack of co-operation at lower levels.
- **Participation of all stakeholders**; This principle is considered as vital for the resolution of conflicts related to ecological effects of agricultural activities as well as for the social compatibility of decisions. It is sometimes not that transparent who the stakeholders are, particularly if they are only temporary stakeholders like migrating herdsmen or shifting cultivators who use certain areas only every few years.
- **Informal regulations for land use;** Unclear land rights are perceived as a *"killer assumption"* in land use planning, meaning that until land tenure is solved planning is not sustainable. The example of Thailand is mentioned, by which the government tolerates agriculture on protected forest areas on the condition that villages demarcate an outer user boundary beyond which there is no use of any kind. However, this tolerance by the government has its limitations and needs to be formalised.

The following sequence in the planning process is a summary of how FAO (1993,11) suggests it in 10 steps. The first three steps are organisation, then steps 4-6 seek alternatives, followed by decision-making and implementation:

1. Establish the terms of reference; This starts with the present situation, finding out the needs of various stakeholders, deciding the area to be covered;
2. Work Organisation; At the second stage it is decided what needs to be done, the planning team is selected and a schedule drawn up;
3. Problem analysis; The existing land use is assessed and problems of various stakeholders identified, including constraints to change;
4. Identification of opportunities for change; A range of land use options is identified and presented to the public for discussion;
5. Evaluation of land suitability; Land use requirements are established for each land use type and matched with the physical properties of the land;
6. Appraisal of environmental, economic and social alternatives; Assessed for the community as a whole in terms of positive and negative consequences;

7. Selection of the best option; public and executive discussions are held on viable options and consequences to reach decisions acceptable to all parties;
8. Preparation of a land use plan; this includes appropriate land management, selected improvements, budgets and how everything will be implemented;
9. Plan implementation; FAO propagates a separate project for the plan implementation, whereby the planning team should work in conjunction with implementing agencies;
10. Monitoring and revision; The plan is modified according to progress.

2.4.4 Limitations and key controversial issues

Controversial issues often preclude a willingness for a dialogue between the majority of participants. The effects of framework conditions are not directly part of land use planning, but have a major influence on its success or failure. The insecurity of land and user rights reduces the decision potential of land users, usually in a situation where there is not a willingness to make a high investment in land and labour. If the natural resource situation is intact, there are usually few thoughts on its protection. If on the other hand the resources are badly degraded, then the means to improve them are usually missing. The division of labour by gender and age is also important, for groups have different priorities. Furthermore, the daily chores do not allow the people to carry out long-term improvements if they are not accompanied by short-term economic benefits. In conflict resolution, traditional organisations or authorities are important, sometimes more so than government bodies, yet external support is important if traditional mechanisms fail.

A number of key conditions for the success of land use planning have been identified by SOMBROEK and EGER (1997,6). Successful land development is characterised by simplicity, accessibility for the resource poor and low risks, resulting in an increased demand on land that should lead to a coordinated planning effort. Guaranteed security of land rights are important for a link between the extension of land rights and land-use concessions to good land care. A commitment by local politicians is important for the clear identification of issues and their credibility. Implementation is part of planning, which necessitates good institutional linkages for an effective integration of sectoral interests. Traditional knowledge of the local environmental and land classification are useful to enhance acceptability. Given the controversies over shifting cultivation and an unclear policy framework for the highlands of Thailand, the limitations of land use planning as well as key problem areas at community level will be assessed.

3 Research Methodology

Based on the four problem complexes identified in the introduction, namely environmental, agricultural/livelihood, policy/institutional and data availability, the methodology also takes into account the failure of the TG-HDP Land Use Planning Teams, so as not to re-invent the wheel. It seems obvious to propagate planning teams composed of stakeholders and government agencies, and the theory clearly advocates such an approach, yet in this case it did not work. This necessitated a re-examination of the two key conditions stated by FAO, namely changes in land use agreed by all parties involved as well as the political will to implement a land use plan. Looking back at the TG-HDP, neither of the two conditions for success applied, as forest department officials stayed away from planning meetings and therefore there was never a land use plan agreed by all parties, let alone a political will to implement it. The consequences of this situation were only realised after fieldwork had started and led to a complete reorientation of the research plan in order to assess the obstacles to a participatory planning approach. Therefore the analysis of the policy situation occupied a major part of the thesis, with a focus on the sub-district (Tambon) level in the current process of decentralisation and options for local initiatives in spite of a lack of political framework. Within this context, the research approach followed a call for the application of "*hybrid research*", whereby natural and social environmental science are integrated into a holistic perception of land use planning (FORSYTH 1998,113). The above components were examined in chronology, yet since planning is an iterative process, the research followed the same path.

3.1 Components of the research approach

3.1.1 Main objectives and local realities

The very complex problem situation shows the diversity of issues and opposing interests in natural resource management, particularly when the competition for land and water are increasing, yet at the same time a centralised government struggles to take a unified planning approach. Therefore the challenges represent an ideal case study for land use planning in the hope to identify ways to overcome this difficult situation. In this context the original technical planning approach was changed to a modified objective once the local conditions were witnessed. The original objective was:

The development of a method to combine the "top-down approach" of land use planning with remote sensing tools with the "bottom-up approach" of full integration and participation of local communities, in order to maintain natural resources and to safeguard sustainable, ecological farming systems.

Due to several new developments after fieldwork began, underestimated policy impacts and false assumptions, the objective was modified to:

The assessment of participatory land use planning in the highlands of northern Thailand, with hill tribes as the primary stakeholders and government agencies as the secondary stakeholders, based on the agricultural systems of the hill tribes, the policy framework, as well as institutional platforms for communication.

The objectives were formulated into leading research questions, and two hypotheses. A research plan was formulated as a guideline to examine the following (see Annex IV):

- The reasons for the difficult land use situation in the highlands;
- Description and quantification of the type, amount and management of existing land use in selected villages with representative farming systems;
- Necessary contributions of the different stakeholders for natural resource management and protection strategies to improve land use patterns;

- An analysis of the current process of decentralisation with resulting policy requirements for the implementation of participatory natural resource management at village and sub-district level.

Based on the above objectives, two hypotheses are verified, one of a technical nature and one of an institutional/application nature:

1. **While hill tribe farmers are adapting to permanent agriculture and settlement, they preserve their natural resources at the same time.**
2. **In spite of a lacking policy framework, the Tambon will become a communication platform for planning by various stakeholders in the highlands at local level, either formally or informally.**

The research was conducted towards the end of the longest running foreign funded development programme in northern Thailand (1981-1998) and had to acknowledge modified local realities of Community Based Land Use Planning and Local Watershed Management (CLM) as well as recent policy developments, summarised below:

- **Guidelines and reality**: The applied CLM approach during the field research (January 1997 to March 1999) differed from the various TG-HDP documents. The guidelines state that a participatory approach with Land Use Planning Teams (LUPT) is functional (BORSY and v. ECKERT 1995,4; DIRKSEN 1996,14). The concept has also been referred to as an established structure (GTZ 1996,36; BETKE 1994,134), yet upon arrival it was found that these teams had ceased to exist. Instead, the TG-HDP staff worked with villagers directly, with little involvement of government agencies.
- **Data aggregation**: The same CLM guidelines proposed that satellite images, aerial photographs, Global Positioning Systems (GPS) and a Geographic Information System (GIS) are readily available and are actually used by implementing agencies (BORSY and v. ECKERT 1995,11). This was not the case, for the process had never been officially sanctioned by the Thai government. In spite of this, the TG-HDP focused on data aggregation in the final land use planning phase till 1998, hence the integration of village maps into a GIS was in the project's interest. However, there were only a few village maps available for digitisation. In Huai Poo Ling maps were available for 10 target villages, while in Nam Lang, where CLM started in 1990, only 3 villages had entered their data onto maps, an indication that there were other underlying reasons why maps had not been produced consistently.
- **Formal or informal organisations:** During the process of scaling up land use planning activities, three neighbouring villages initiated a hill tribe network in 1996 (JANTAKAD 1998, vol.2,54). The network took over some functions of the abandoned Land Use Planning Teams (LUPT), yet with little support from government agencies' field staff and no formal official mandate. However, the implementation of decentralisation at sub-district level, with newly forming Tambon Administrative Organisations (TAO), could mean an uncertain future for the hill tribe network.
- **Pending policies:** The CLM guidelines state that the Thai Forestry Sector Master Plan has become policy (BORSY and v. ECKERT 1995,1), but this is still not the case and weakens communal forest settlement as well as management initiatives. The same applies to the Community Forestry Act, debated since 1991 and approved by Parliament in principle, but which has still not been passed as a law (MAKARABHIROM 2000,3). This situation reduces all planning results to provisional achievements.

The above conditions are described in some detail, for they had quite an impact on the research design and the collection of data. What initially focused on the technical support of an on-going extension and planning process changed to examine the impact of incoherent policy and decentralisation much more. Then came the research needs expressed by TG-HDP staff, which were important as the enterprise was set up as project accompanying research. While it is very useful to consider research in terms of the application of results in target areas, this approach also bears the inherent danger of a project evaluation or close identification with project activities, to the extent that the researcher may lose the necessary distance for the assessment of the research plan. It was at times very difficult to keep track of the middle path without too much divergence towards project implementation or the application of an abstract planning model. The resulting outlook of who can use research results in the absence of a project gains importance, particularly since GTZ withdrew from natural resource management assistance in Thailand,

with the exception of the Chiang Mai branch of the Sustainable Management of Resources in the Lower Mekong Basin Project (ANONYMOUS 1999). Perhaps this was premature given the current focus on *"Good Governance"* that increasingly influences the development debate. Therefore it was important to consider the post-project institutional environment at village and sub-district level to produce results pertinent to local stakeholders in the planning process.

Even though GTZ has more or less withdrawn from natural resource management in Thailand, other organisations continue the participatory land use planning approach. The furthest steps have been taken by CARE Thailand with the establishment of Village Forest Conservation and Watershed Management Committees in Mae Chaem district of Chiang Mai (ANONYMOUS 1997), in which government and village representatives are members and sign land use agreements that use digitised maps as baseline information. So far this is the only documented case where this has led to written documents and could serve as a model to be followed. In a continuation of this approach, a new project phase focuses on the empowerment of these watershed networks as part of the Tambon Administrative Organisations (TAO) under the ongoing decentralisation (SRIMONGKONTIP 2000). This shows that land use planning has progressed to institutional implementation by local organisations, with ever-stronger demands for a reformed and unified policy framework for the highlands.

3.1.2 Resulting focus of the research approach

The focus of the research approach goes back to the unclear policy situation or lack of a framework as the starting point for the failure of the TG-HDP land use planning teams. The policy development has indeed been very confusing and contradictory, hence it is important to understand the history in order to get a better picture of how it affects the present situation. The chronology of policy development also goes beyond a description in terms of a unisectoral approach like forestry, agriculture or social integration, but shows the interactions and sometimes concurrent realities affecting more than one sector. Particularly from the point of view of hill tribes, issues like permanent settlement, forest use as well as protection, agricultural sustainability, village boundaries and Thai nationality are interrelated. A historical overview therefore serves to better illustrate the state of uncertainty prevalent among the primary stakeholders in the highlands.

A second focus lies on the effects of the CLM approach in terms of agricultural zonation, the identification of watershed forest areas, conflicts with neighbouring villages, and the potential of sustainable planning approaches. Of particular importance is the village boundary, which is a new concept to most hill tribes, and the lack of acceptance of own demarcations at the time of village registration. When it comes to decisions, villagers' own demarcations are not accepted by government agencies and can easily be overturned. This also affects areas under shifting cultivation, for long term fallow areas are often considered as protected forest land by the Royal Forest Department (RFD) with its mandate of forest protection. In this context the use of Geographic Information Systems (GIS) was considered to display achievements to date as well as to show inconsistencies in the recognition of village boundaries by government agencies. The appropriateness of digitised maps is also examined in comparison to topographic models at village and Tambon level, including an assessment of their further use in planning negotiations.

The third focus lies on the institutional environment at Tambon level as the platform where centralised planning comes into direct contact with society under the current decentralisation process, represented by elected village leaders. In this context the issue of the viability of formal and informal organisations is of importance, for in Pang Ma Pha district hill tribe leaders founded a hill tribe network among themselves to deal with conflicts over natural resource management. The future of the network is uncertain, given the establishment of Tambon Administrative Organisations (TAO) with often the same members as representatives. For village leaders official government functions are very new and they have to get used to new responsibilities as well as rights as communal speakers with Thai nationality. Additionally, linkages to district planning are examined as well as the extent to which national policy allows or inhibits such approaches.

In an acknowledgement of the local situation, four components have been identified as the cornerstones for a land use planning model pertinent to this thesis (Table 3-1). There have indeed been a number of changes and very promising developments that deserve acknowledgement, most notably in the formation of inter-village land use planning networks. This development has at the same time taken natural resource management issues out of the village and into contact with first neighbouring villages, and later with government planning bodies. It is there that the top-down influences of national policy can be combined with technical means of presentation and display, such as topographic models and digitised land use maps to set priorities and implementation means. By placing a planning platform at the centre this also considers the issue of aggregation and up scaling of information to meet regional planning priorities of the government. Starting with individual villages affected by development activities, a further step was the creation of inter-village networks that later have come into contact with decentralisation policy of the government in the form of TAO membership or sub-district organisations. The key for future planning lies in these communal organisations in the post-CLM period.

Table 3-1: Components of the land use planning model

Farming systems and adaptations	Policy framework development	Community networks and organisations	Planning tools
Representative farming systems in selected villages	History of highland development policies	Village level planning organisations, formal and informal	Past land use perception and display means
Effects of CLM interventions and changes towards permanent farming	Policy changes during the research phase at various government levels	Hill tribe networks and formal government decentralisation by means of TAOs	Topographic models used by the TG-HDP for planning
Future scenarios for agriculture and diversification	Necessary changes for future planning, stumbling blocks	Sub-district level organisations and links to district planning	Digitised maps and 5-year land use plans

3.1.3 Diamond model for planning

The components described above should not be seen as separate entities, for there are constant interactions that have reciprocal effects. Nevertheless, the model starts with an overview of highland development policies to show some of the trends and contradictions that have influenced natural resource management. This is followed by interlinkages between the effects of the TG-HDP planning activities as well as planning tools in the present situation, whereby a planning platform at local level stands in the centre of the model. This represents the process of decentralisation that has increasing influences on highland development. The planning model may thus appropriately have the form of a diamond with interlinkages as shown below (Figure 3-1). The purpose of showing it as a diamond model is a consideration of the various activities that have taken place in the past in terms of agricultural and livelihood changes, policy modifications and effects of the TG-HDP approach of CLM. These activities and developments have affected planning from various sides, often more concurrently instead of sequentially, thus reflecting real life realities. These realities will also continue to affect planning in future, hence they are shown as external influences that will shape agreements and approaches emerging from the central communication platform. A proposed land use planning approach is finally suggested, focusing on the necessary commitments of government agencies for effective implementation at sub-district or TAO level, yet with caution given many uncertainties.

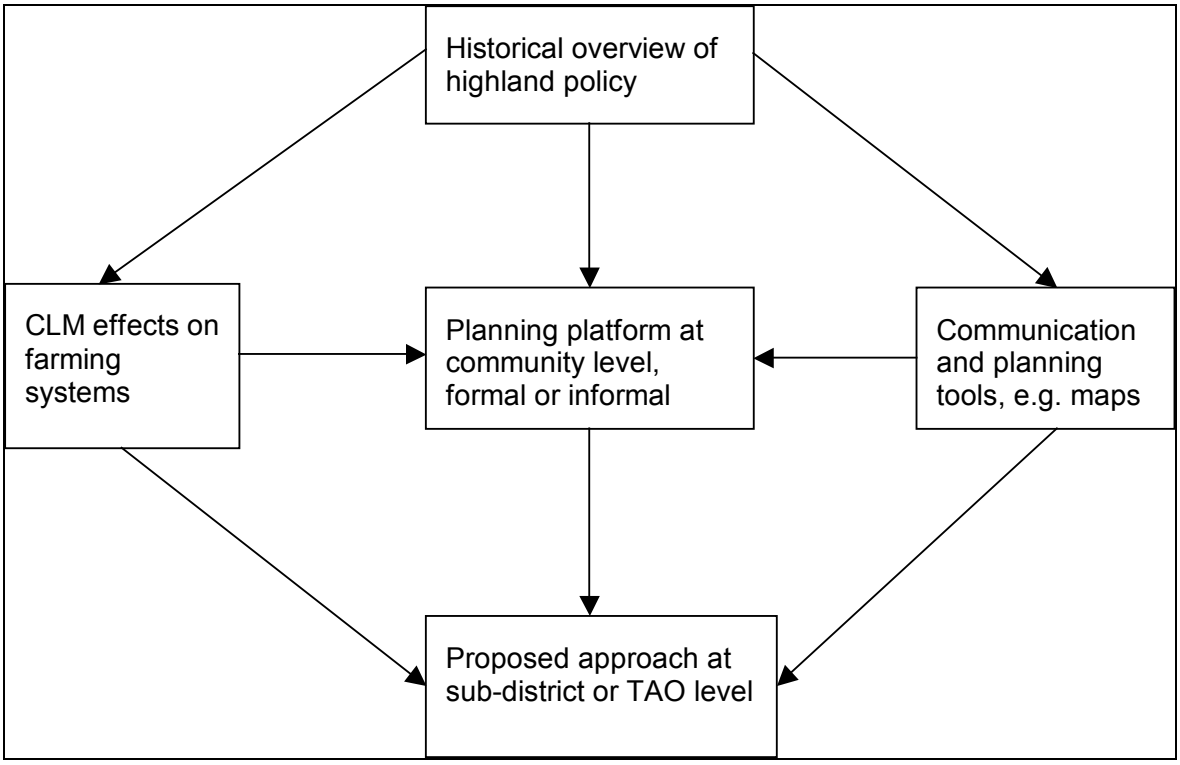


Figure 3-1: Diamond model for land use planning

3.1.4 Challenges for participatory GIS

With the aim to combine technical and participatory means of survey for land use planning, it was attempted to combine Community Based Land Use Planning and Local Watershed Management (CLM) with Geographic Information Systems (GIS). The advantages and risks of participatory GIS for hill tribe farmers as the primary stakeholders and for government agencies are manifold. The concept of a *"Participatory GIS*" has even been labelled an *"Oxymoron*" or contradiction in terms, implying that participation of local communities and high technology tools are mutually exclusive. There are several challenges when combining participatory approaches and GIS (ABBOT et al. 1998,30):

1. Scaling up to show local concerns as well as broad regional or national perspectives, so that local priorities can be integrated into regional plans.
2. The access of local people to decision making power through the ownership and use of data, since in the past this access was limited to a few high-level decision makers and thus constituted a merely extractive extension tool.
3. A land use model or GIS turns local knowledge into public knowledge and out of local control, and can be used to locate resources or extract more taxes.

The application of GIS in Thailand goes back to a World Bank land policy analysis in 1985 (ONGSOMWANG 1993,15), though it was carried out in the USA by a consulting firm. Since then the United Nations Environment Programme (UNEP) carried out an environmental case study in 1987 and the Thailand Development Research Institute (TDRI) in 1988. A more recent assessment of forest inventory methods recommends the combination of remote sensing and GIS for forest management planning, and even proposes a decentralised national forest inventory (ONGSOMWANG 1993,195). GIS was even extended to land use changes in the highlands in order to monitor the effects of population pressure on forest cover and productivity, combining spatial information and socio-economic factors (EKASINGH et al. 1996,402). These issues have also been considered in more detail for northern Thailand including areas settled by hill tribes by scientists from the local office of the International Centre for Research in Agroforestry (ICRAF,

SAIPOTHONG et al., 1999). The extractive aspects can thus already be analysed in case studies, so the challenge remains for the inclusion of land use classification by hill tribes in order to include their priorities in joint planning approaches.

Given the problems prevalent in the highlands and building on the CLM approach, it was important to document the project achievements and to integrate the land demarcations into a computer database for modification and upgrading for future planning to produce:

- Durable and easily transportable maps recognised by all parties;
- Aggregated information at sub-district level for regional planning;
- A tool that allows regular updating of land use data for the rapidly changing land use in the highlands.

The use of a GIS may help to overcome the lack of a common map base for the assessment and management of natural resources such as forests, water resources, protected areas, agricultural land and village locations. The issue of data management and local political interests is a crucial one in the unclear policy framework for highland development. It is has the potential to help in conflict resolution between villagers and government agencies, the assignment of land titles and the determination of sustainable forms of agriculture. Yet at the same time, the threat that the revelation of land use to authorities can backfire for farmers in the form of land confiscation is also very real.

3.2 The field research

3.2.1 Introductory phase

The fieldwork began in March 1997 with a three months introductory phase of familiarisation with the TG-HDP infrastructure, activities and objectives for the remaining final project phase, which included an identification of what contributions the research could make. This included many visits to the various project areas with staff, so as to understand the diversity and status quo of the CLM approach and how the project defines its Participatory Working Approach (PWA). It was also important to become familiar with the highland environment, the farming systems, the culture of the hill tribes and their understanding of the project driven land use planning. There were individual and group interviews in villages by TG-HDP staff and short-term consultants, which were used for mutual familiarisation with farmers. Interviews were conducted with the help of translators in Lahu and Karen language.

3.2.2 Selection of target villages

The next phase was the selection of six target villages (underlined in bold) for detailed surveys of representative farming systems under the CLM approach in both project areas, namely Nam Lang (Figure 3-2) and Huai Poo Ling (Figure 3-3). Nam Lang is the name of the watershed area and gained district status in 1996, upon which it was renamed Pang Ma Pha district and was subdivided into the four Tambon or sub-districts of Pang Ma Pha, Tham Lod, Na Pu Pom and Soppong, inhabited by Shan, Karen, Black Lahu, Red Lahu and Lisu. In contrast, Huai Poo Ling sub-district (Tambon) is inhabited mainly by Karen. Thereby the two traditional shifting cultivation systems in transition to permanent farming were represented, namely **pioneer swiddening** by Lahus in Pang Ma Pha and **rotational swiddening** by Karen in Huai Poo Ling Sub-District (Muang District). In Tambon Wawi project activities had ceased and CLM was never practised.

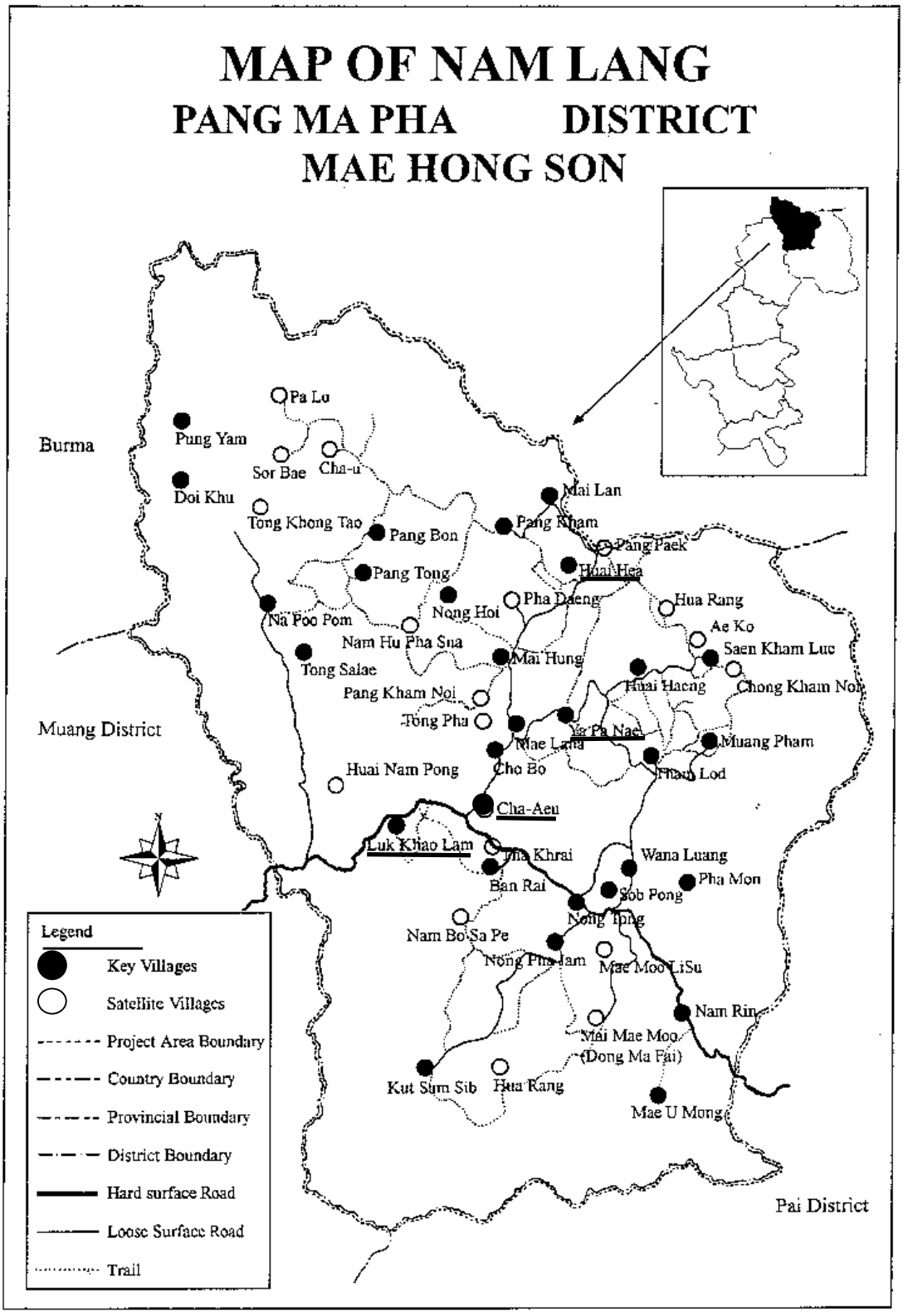


Figure 3-2: Map of Pang Ma Pha district (Nam Lang)

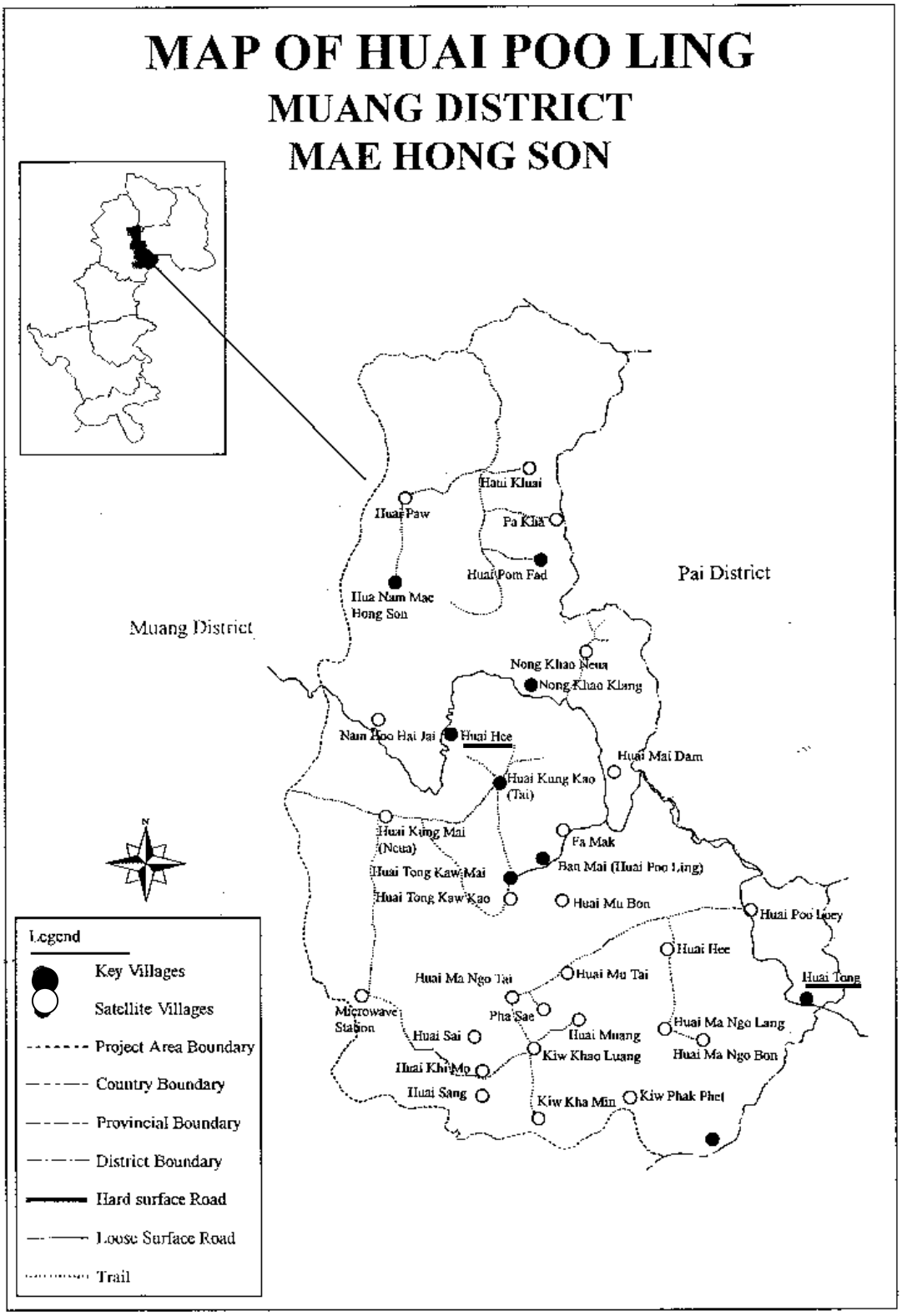


Figure 3-3: Map of Huai Poo Ling sub-district

The following main village selection criteria were used (Table 3-2):

1. Overlap with areas of the two Thai MSc students as well as the German MSc student (the research grant from TÖB stipulated the inclusion of Thai and German students);
2. Survey areas located in both TG-HDP project areas to obtain a representation of two different swiddening systems as well as different ethnicities;
3. Same administrative level of Tambon (sub-district) for data aggregation and assessment of administrative planning structure;
4. Inclusion of a village outside the CLM target villages for comparison;
5. Overlap of village areas with protected conservation forests to assess conflicts with the Royal Forest Department (RFD);
6. Contrast between *"key"* and *"satellite*" villages to assess differences in decision making on natural resource management. Key villages are officially registered in the government gazette, whereas satellite villages do not have village status and depend on the key village committee they belong to for any government service;
7. Farming systems diversity in relation to rice, where villagers differentiate between pure paddy farmers, mixed cropping and pure highland farmers.

Table 3-2: Characteristics of surveyed villages (source: TAO offices and TG-HDP)

Village profiles	Tambon Pang Ma Pha (population 2,600)				Tambon Huai Poo Ling (population 3,500)	
Name	Huai Hea	Bor Krai (Cha-Aeu)	Pa Charoen	Luk Kao Lam	Huai Tong	Huai Hee
Tribe	Lahu Sheleh	Lahu Sheleh	Lahu Nyi	Lahu Sheleh	Karen	Karen
Households	35	31	14	54	112	22
Population	172	169	77	278	470	200
Area (ha)	2,103	1,451	48	2,381	1,988	1,700
Density people/km^2	8	12	160	12	24	12
Status[1]	key village 1987, No 8	key village 1996 No 11	satellite of Ya Pa Nae	key village 1988, No 9	key village 1964, No 5	key village 1983, No 8
Established	more than 50 years	20 years	11 years	more than 10 years	more than 100 years	more than 170 years
Model	1995	1995	1992,1998	1997	1995	1995
Map	1996-97	1996-97	none	1996-97	1995-97	1995-97
Group type[2]	3	2	1	1	1	2
Students	None	None	German	Ger.+1 Thai	None	2 Thai

1. Upon registration with the Department of Local Administration (DOLA), a village is given a number, such as No. 8 for Huai Hea in ascending order by registration date. A village is then also given a Thai name like Bor Krai, which had the name of the Village Headman Cha-Aeu. The satellite village of Pa Charoen is only referred to by its key village Ya Pa Nae (No.5). Village registration is a precondition for the provision of government extension services.
2. Refers to the First Highland Master Plan (1992-1996), in which the Department of Land Development classified hill tribe villages according to their potential for permanent settlement and farming, where type 1 is a permanent village. Type 1 villages receive the most government support, while type 3 may face relocation. This classification was conducted in a very top-down manner, without the involvement of local communities living there.

3.2.3 Digitisation of land use maps

Towards the end of 1997, all available maps at village and sub-district were collected for digitisation and inclusion into a Geographic Information System (GIS). The digitisation was done at the Survey Section of the Northern Narcotics Control Office (NNCO) as well as at the Department of Geography of Chiang Mai University. NNCO is the Chiang Mai branch of the Office for Narcotics Control Board (ONCB). The GIS programme Arc View 3 with baseline data on Mae Hong Son province was obtained from the Department of Urban and Regional Planning of Chulalongkorn University and was presented by Dr. Saengsuan in a workshop at the TG-HDP office in October 1997. The purpose was to assess possibilities to integrate hand-drawn village maps into the programme and to think of ways to use this data for future land use planning activities.

Digitised land use maps were produced using the following procedure. Hand-drawn land use maps were collected in all the 10 CLM target villages of Huai Poo Ling and in three villages in Pang Ma Pha, as only three villages have transferred their land use models onto maps. For Pang Ma Pha it was thus not possible to aggregate the maps into Tambon maps. The village maps were digitised using a hand digitiser into the GIS programme Arc Info and then converted into maps using the map-drawing programme Arc View 3. Contour lines were obtained from the Remote Sensing Centre of Chiang Mai University (CMU) to give a three-dimensional perspective, with 20 m intervals for the village maps and 100 m intervals at Sub-District level. The roads and streams, as well as the Tambon boundaries for Huai Poo Ling were obtained from the Survey section of NNCO in digitised form and overlaid with the remaining data. The different land categories were then colour coded using the same colours as on village maps. Maps were displayed using the Universal Transverse Mercator (UTM) coordinates with grid points in steps of 1 km² for village maps and 5 km² for the sub-district map. The polygons for different land categories were added for area calculations. The same procedure was applied to Tambon Huai Poo Ling and aggregated. Adjacent villages often had overlapping outer user boundaries (marked in pink on the map), which is significant in the case of land disputes and official village registration.

The next step intended to overlay village land use maps with the watershed classification for both project areas, but the Royal Forest Department in Bangkok claimed that this information was not available in digitised form, which seemed strange given the proposal for GIS use in forest management (ONGSOMWANG 1993). At district level it was possible to see the maps, but not to make copies, probably for reasons of political nature. A third component of inclusion of village registration data was more successful, though it was not possible to obtain written criteria from the Department of Local Administration (DOLA) in Mae Hong Son town of how land is allocated to one or the other village. However, village registration documents were obtained for 1995 when Huai Poo Loei separated from Huai Tong as well as Phapuak from Huai Hea to become key villages, and for 1996 when Bor Krai separated from Cho Bo as a key village. For the inclusion of demarcation points on digitised maps, DOLA vectors were converted to UTM coordinates as below:

- Divide the source format (e.g. MB 215 755) into 4 parts;
    i. M is the first
    ii. B is the second
    iii. 215 is the third
    iv. 755 is the fourth
- The value for the X-coordinate comes from the first part (M);

    Where L = 3, **M = 4**, N = 5, P = 6, Q = 7 etc. Then the equivalent value for the first part (4) is joined with the third part (215) and 00, resulting in: **4 215 00.**
- The value for the Y-coordinate comes from the second part (B);

    Where S = 16, T = 17, U = 18, V = 19, A = 20, **B = 21** etc. Then the equivalent value for the second part (21) is joined with the fourth part (755) and 00, resulting in: **21 755 00**.

- The resulting equivalent UTM vector for **MB 215 755** therefore becomes;

  4 215 00 (X-coordinate) and **21 755 00** (Y-coordinate)

The conversion of vectors to resulting coordinates is summarised (Table 3-3).

Table 3-3: Conversion of vectors used by DOLA to UTM coordinates (based on village registration documents of 27 April 1995 and 2 May 1996)

Huai Hea village (1995)			Bor Krai village (1996)			Huai Tong village (1995)		
DOLA vector	X-value	Y-value	DOLA vector	X-value	Y-value	DOLA vector	X-value	Y-value
MB215755	421500	2175500	MB183646	418300	2164600	MB205176	420500	2117600
MB229759	4229 00	21759 00	MB217654	421700	2165400	MB215135	421500	2113500
MB246762	4246 00	21762 00	MB223595	422300	2159500	MB190105	419000	2110500
MB234736	4234 00	21736 00	MB174609	417400	2160900	MB170120	417000	2112000
MB208722	4208 00	21722 00	MB152609	415200	2160900			
MB211730	4211 00	21730 00	MB157620	415700	2162000			
MB185745	4185 00	21745 00						
MB195758	4195 00	21758 00						

Once the maps had been digitised and printed in poster size (A1) at the ONCB Survey Section in Chiang Mai, they were taken back to villages and TAO members for modifications or corrections, before they were shared with government officials. With the closure of the TG-HDP it is likely that the models will not be updated and will disintegrate over time, and the hand drawn maps may suffer the same fate. Digitised printouts can also be distributed to other agencies and can be taken to network or district meetings to discuss land use issues. Maps were also distributed to district forest officials to facilitate their work in land use monitoring. The results from mapping were first presented at the TG-HDP final workshop on natural resource management in June 1998, and eventually the data and the GIS software were then transferred to the Survey Section of ONCB as well as to the ICRAF office in Chiang Mai at the final workshop in February 1999 (see Annex I for events).

3.2.4 Field surveys

From July 1997, joint field surveys with TG-HDP staff were conducted at village level and at site offices for the process of topographic modelling of land use and villagers' perception regarding the usefulness of models and hand-drawn maps for planning (Photo 3-1). A series of interviews were conducted without project staff to give villagers the chance to speak more freely on communication and planning problems (see questionnaires in Annex II and III). There were also visits to various government agencies in Bangkok in April 1997 for data collection on policies and mapping approaches, and again in June 1998 for the collection of aerial photographs at the Royal Survey Department. In September 1997 and December 1998 it was possible to join a helicopter flight with the Survey Section of the Office of Narcotics Control Board (ONCB) in order to take pictures of land use from above.

In preparation for the final TG-HDP workshop on Natural Resource Management in June 1998 was the 5-day Community Leaders Cross Visit Programme supported by the Highland Peoples Programme of the UNDP, for which 17 village representatives from project areas of GO and NGO highland development programmes were taken as a group to the various project areas in Chiang Mai and Mae Hong Son province in order to exchange different work approaches and discuss problems. The first village in the Doi Inthanon

National Park (Chomthong district, Chiang Mai) was caught in the land use conflict with lowland Thais that staged a roadblock the day after the group passed (see Chapter 1.1). Other project areas included Mae Chaem district (Chiang Mai) where CARE operates, Pang Ma Pha district in Mae Hong Son (TG-HDP), and Mae Taeng district in Chiang Mai where the Thai-UN Sam Muen Development Programme (SMDP) operated till 1994, as well as a project area of the Thai NGO Hill Area Development Foundation (HADF). These village leaders also participated in the TG-HDP workshop and shared their experiences.

Photo 3-1: Manual transfer of Tambon map to the model in Huai Poo Ling

After the closure of the TG-HDP in September 1998, a final series of interviews were made about the future of CLM under the current decentralisation. This time it was possible to go without project staff, which enabled a much more direct and detailed communication than with project staff, enhanced by communication in the villagers' own language (Photo 3-2). A survey of numbers and types of cultivated plots was conducted for all inhabitants of the 4 target villages in Pang Ma Pha for the purpose of triangulation with areas on maps. The Pang Ma Pha Hill tribe Network was also interviewed about its purpose and operation, particularly on its future given the formation of Tambon Administrative Organisations (TAO). In Huai Poo Ling the TAO is at a very early stage of formation, so the focus was on land use changes and the relevance of land use models. Interviews were carried out on:

- Resource availability and food sufficiency;
- Land use changes during the last 10 years;
- Land categories and land use based on villagers assessments;
- Village boundaries and conflicts;
- Farmers strategies to solve land scarcity problems;
- Village regulations for natural resource management and land use.

Photo 3-2: Interviewing a village elder with a Karen interpreter

The field work ended with a final workshop on 18 February 1999 at Chiang Mai University with 20 participants to present preliminary research results, followed by a four-day field trip to the project areas to discuss the impact of CLM with hill tribe farmers and to assess the future of land use planning.

4 History of policies and institutional setting

"Government political and administrative policy affecting tribal populations changes continually". (CHOTICHAIPIBOON 1997,100)

The above summarises the changing political positions of the government towards hill tribes as the previously autonomous mountain peoples are more and more exposed to government administrations. The process has been dubbed a *"carrot and stick"* policy of welfare and development activities on the one hand, and threatening with law enforcement measures on the other (DIRKSEN 1997,330). This characterisation describes the approach of the Office of Narcotics Control Board (ONCB) towards drug abuse control, but since it is also the main agency for bilateral development projects, the description may be extended to other areas like forest management as well. The policy evolution essentially followed a gradual process of initially centralised control of remote areas towards more recognition of local needs and people. It started with forest management and control of hill tribe areas in the name of opium suppression, via intermediate coordination steps of master plans for highland development, and most recently a new constitution that emphasises the participation of local communities.

4.1 Policy prior to planning for the highlands

4.1.1 Unlimited natural resource exploitation

A chronological overview of policies affecting hill tribe life and the resulting social marginalisation into illegality by the state reveals the complexity of interaction between previously autonomous forest farmers and central government agencies with unisectoral approaches such as forestry or social integration only. The earliest policy affecting hill tribes is the first Nationality Act of 1913, which granted Thai citizenship based on bloodline (Thai father) and territorial basis (born in Thailand), thus replacing previous customary laws. A first national census in 1956 failed to include hill tribes and thereby excluded them from Thai nationality, which remained so till 1965 (THE NATION 2000), thereby setting them apart very early on. There are various dates given for the beginning of government development programmes for hill tribes, starting with schools in 1935 (CHOTICHAIPIBOON 1997,98), welfare services in 1951 (CHANDRAPRASERT 1997,84) and the establishment of the Committee for the Welfare of Remote Populations in 1956 (CHOTICHAIPIBOON 1997,98). Yet both authors confirm 1959 as the establishment of the Hill Tribe Committee, a national organisation in charge of formulating welfare and development policies. Even though these were specifically targeted towards hill tribes, a number of other general policy developments that started earlier also had effects on the highlands, particularly in the areas of forestry, land classification and ownership.

In terms of land and forest policy, effects first came indirectly from the Royal Forest Department (RFD) established in 1896 (under British leadership). Until 1953, forest harvest was in the national interest and emphasis was placed on regulated forest exploitation (mainly teak), so that logging became widespread in this *"Phase of Exploitation"* (JANTAKAD and GILMOUR 1999,93; PRAGTONG and THOMAS 1990,10). The first attempts at setting aside protected forest areas were made in the form of the Forest Conservation Act in 1913, the Forest Protection Act in 1938 and the Forestry Act in 1941. The latter provided the most comprehensive coverage of forest law, including felling of tree species and activities on lands that are not under private ownership. In 1954 the Land Code was passed, under which 50 % of the country were declared forestland under the management of RFD. In 1959 opium cultivation was outlawed and criminalized, the same year as the establishment of the Hill Tribe Committee under the Department of Public Welfare (DPW, established 1940, first under the Ministry of Interior). Hill Tribe Land Settlements were established to gather, support and control the previously autonomous hill tribes living on the border of the kingdom in remote mountainous areas. A controversial approach *of "voluntary village relocation"* of mainly pioneer shifting cultivators to these land settlements at lower altitudes was initiated, with the aim to extend state control and to eradicate opium cultivation that was part of their source of income (RERKASEM 1998,4). How *voluntary* resettlement really was remains speculation.

4.1.2 Vanishing forests, national security and resettlement

The next phase was marked by a period of contradiction between national development policy and forest protection. In 1960 the government established the National Land Classification Committee to carry out soil surveys and land classification for agriculture, a task that was later continued by the Department of Land Development (DLD) established in 1963 (ARBHABHIRAMA et al.1987,34). At the same time, national planning in five-year cycles was initiated, and the 1st National Economic and Social Development Plan (NESDP, 1961-1666) encouraged the exploitation of forest resources to attract foreign currency. At the same time as forest exploitation peaked and the export-oriented agriculture expanded rapidly, a series of acts to protect the nation's natural resources were passed, namely the Wildlife Reserves and Conservation Act of 1960, the National Parks act of 1961 and the National Forest Reserves Act of 1964. The latter declared 50 % of the country as protected forests (JANTAKAD and GILMOUR 1999,95). As laudable as these efforts to protect the environment may seem, one wonders if the construction of a highway bisecting the first national park Khao Yai (established 1962), with a golf course at its centre, was done for wildlife protection or more for recreation! Although only three national parks and one wildlife sanctuary were established during the 1960s, this figure has gone up to 112 and 44 respectively, covering 16 % of the country (UNCSD 1997), though most of them are too small to sustain intact wildlife populations. For the hill tribes this meant that most of them found themselves settling illegally by law, and on top of that they were not considered as Thai citizens, which deprived them of civil rights. This situation improved slightly with the passage of the Nationality Act in 1965, giving hill tribe children the right to Thai citizenship provided both parents are Thai nationals, yet there were only very few who could prove that (AGUETTANT 1996,59). The administrative procedure is still very complicated, and hill tribes were only included in national censuses from 1970, so for them citizenship still continues to be a major issue of civil rights.

In 1965 Thailand began to experience political insurgency influenced by the Communist Party, particularly in northern tribal areas, and hill tribes found themselves trapped between a government that did not accept their lifestyle and Thai communists seeking their support (CHANDRAPRASERT 1997,84). Against the background of the Vietnam War, they were now directly confronted by the army in combat zones, while the Department of Public Welfare (DPW) continued its welfare programmes under the Hill Tribe Welfare Division. Yet in 1969 hill tribe issues became more important and the Central Hill Tribe Committee was established under the Ministry of Interior (MOI), which greatly increased the *"voluntary"* relocation of tribal people to lowland areas, with limited support in housing, water and health facilities (CHOTICHAIPIBOON 1997,98). At the same time, the first large-scale highland development projects were initiated as Royal Projects, which focused mainly on the identification of suitable opium replacement crops (DIRKSEN 1997,331). In 1973 the first foreign-funded opium replacement programme was launched, supported by the United Nations Fund for Drug Abuse Control (UNFDAC).

4.1.3 Forest settlement for Thais only, hill tribes should integrate

By now the government accepted degraded forests as a fact and encouraged the agricultural development of these with the Agricultural Land Consolidation Act of 1974, as well as the Agricultural Land Reform Act of 1975 (establishment of the Agricultural Land Reform Office, ALRO) to allocate state-held land to agriculturists for occupation (ARBHABHIRAMA et al. 1987,32). In 1975 the National Environment Board was established and played a vital role in the formulation of a watershed classification for land reclassification, dividing the Mae Ping watershed into 3 classes. Over 60 % of the highlands fell into class 1, which meant no resource utilisation to the point that "*all residents occupying this zone would be evacuated*" (TANGTHAM 1992,4). This caused considerable controversy and was later mellowed. In the same year, RFD was charged with the establishment of *"Forest Villages"* in degraded forest areas and issued land allotment certificates, supplemented by infrastructural development for permanent settlement. The same cabinet resolution was extended to illegal residents of nonwatershed areas in national reserved forests and was called the National Forest Land Allotment Project or STK (HAFNER and APICHATVULLOP 1990,337). The main objective was to legalise squatters by means of land use rights, but it resulted in lowlanders taking possession of forest areas while hill tribes were evicted. The policy backfired completely in that it started a vicious circle of forest clearance for timber and land sale instead of the intended rehabilitation of degraded areas, a particularly serious problem in the upper north (ARBHABHIRAMA et al. 1987,39).

The hypocrisy of this approach is obvious, when considering that hill tribes were excluded from forest settlement, although they had been living in forests much longer than newly arriving Thais and yet fitted the definition of landlessness just as well. In the eyes of the government hill tribes also did not own the land they lived and farmed on, so this approach was one of ethnic segregation. Worse even, the Lahu village of Lo Pah Krai in Mae Ai district of Chiang Mai, which applied soil and water conservation measures, had land taken away that was given to the state owned Forestry Industry Organisation (FIO), not for conservation purposes but for developing a commercial eucalyptus plantation (RERKASEM and RERKASEM 1994,91). This period saw a widening gap between contradicting policies by government departments with forest settlement for Thais only, while at the same time hill tribes were often evacuated by force from forest areas under the new mandate of the committee overseeing forest destruction in 1976 and headed by RFD (CHANDRAPRASERT 1997,85). The fact that in the same year DPW was designated as the main coordinating agency for all matters concerning hill tribes under the new approach of "*Integration Policy*" to make them good Thai citizens seems like bitter irony, since hill tribes were faced with the threat of forceful relocation from their livelihood basis: the forests. While the Ministry of Interior promoted the "*Thaisation*" process with the Department of Public Welfare (DPW), the Ministry of Agriculture remained a threat to hill tribes with the Royal Forest Department (RFD). The year 1976 also marked the establishment of the Office of the Narcotics Control Board (ONCB) as the national coordinating agency for drug abuse prevention and bilateral development projects (CHOTICHAIPIBOON 1997,85), thus adding the component of drug control to the picture.

4.1.4 Security and a watershed classification

The 1980s saw the start of a number of large scale foreign funded highland development programmes, implemented by three lead agencies: the Royal Forest Department (RFD), the Department of Land Development (DLD), both of which belong to the Ministry of Agriculture, while the Ministry of Interior continued with the Department of Public Welfare (DPW). It began with the Thai-Australia Highland Agricultural and Social Development Project (TA-HASD) with a World Bank loan in 1980 and peaked with a total of 168 agencies from 31 government departments and 49 international donors in the late 1980s (GANJANAPAN 1997,205). This plethora of development activities, which divided northern Thailand according to intervention areas of highland projects, necessitated some form of coordination, and hence the 5th National Economic and Social Development Plan (NESDP 1982-86) included hill tribes as an issue for the first time. Security issues, opium reduction, reforestation, the reduction of hill tribe population growth and the conversion of hill tribes to good Thai citizens were the main emphasis (CHOTICHAIPIBOON 1997,100). For administration, a Committee for the Solution of National Security Problems Involving Hill Tribes and the Cultivation of Narcotic Crops was founded and headed by the Ministry of Interior (MOI).

This committee identified 74 areas of opium production and dealt with respective development projects that provided infrastructure and development. In addition, a 1st Master Plan for Highland Development and Narcotic Crops Control was drafted by the United Nations Fund for Drug Abuse Control (UNFDAC), the Social Research Institute of Chiang Mai University (CMU) and the United Nations Development Programme (UNDP) in 1983 (RERKASEM and RERKASEM 1994,26), in an effort to coordinate the increasing complexity of highland development projects and agencies. Due to its political sensitivity and subsequent modifications, as well as weaknesses in terms of unclear agency mandates, the plan was only implemented in the years 1992-1996 during the 7th NESDP, though it was often mistaken as the 2nd Master Plan. The next step in highland control was the set-up of the Centre for the Coordination of Hill Tribe Affairs and Eradication of Narcotic Crops (COHAN) under the Third Army in the north in 1986 (in Chiang Mai) as a powerful authority to coordinate other government agencies and ease the burden of coordination on ONCB (CHANDRAPRASERT 1997,87).

Due to the controversy over the first watershed classification, a revised version was presented in 1983 by the National Environment Board (NEB), which was considered "*an extension of land use planning for forest areas*" (TANGTHAM 1992,5). The classification divided watershed forests into 5 classes according to physical features (Table 4-1).

Table 4-1: NEB watershed classification of 1983 (after TANGTHAM 1992,5).

Watershed class	Physical environment	Proposed management
Class 1 subdivided into:	High elevation (> 500 m), very steep slopes (> 35 %)	Protected or conservation forest, headwater source
Class 1A	High elevation and very steep slopes (> 35 %)	Permanent forest cover
Class 1B	Similar to 1A, yet partly cleared for agriculture or settlement	Should be reforested or maintained in permanent agroforestry
Class 2	High elevation and steep to very steep slopes	Commercial forest, with logging, grazing allowed
Class 3	Uplands (200-500m) with steep slopes	Fruit tree plantation, grazing, agricultural crops
Class 4	Gentle sloping lands	Upland farming, row crops, grazing, fruits
Class 5	Gentle slopes, flat areas	Lowland farming, paddy and other crops

The focus on physical features only, such as slope, elevation, soil, geology and forest cover ignores the hill tribes living in the forests and thus exposed them to the threat of relocation once again. Alternatives to such a classification have been proposed, like one for land use planning with regards to ecological and economic variables (slope, elevation, village location, infrastructure, forest cover) in 1990, and a land capability study to support the environment as well as the people (slope, elevation, water availability, village location, forest cover) in 1994 (KNIE and MÖLLER 1999,146). However, the alternative classifications have not been integrated into policy. 1983 also produced the Land Development Act, which authorises the committee on land development and DLD to undertake any activity related to improving the efficiency or quality of land including soil and water conservation. In 1985 the first formal national forest policy was approved by the Cabinet, which reduced the targeted forestland area of 50 % from 1961 to now 40 %, of which 15 % were to be conservation forest and 25 % production forest. Additionally, any land with a slope of 35 % or more was declared forestland, for which no title deed or land use certificates can be issued. The forest target figures were reversed in 1987 with more emphasis placed on conservation (PRAGTONG 1993,115), but deforestation and uncontrolled forest settlement were thereby not resolved. While the new RFD policy does not explicitly mention hill tribe resettlement, the Thailand Development Research Institute (TDRI) is more direct in setting a threatening atmosphere:

"If the government wants to protect the highland watersheds, it will be forced to institute widespread resettlement of hill farmers… with force if necessary" (ARBHABHIRAMA et al. 1987,80).

4.2 Planning highland development

4.2.1 Logging ban and the First Highland Master Plan

The institutional confusion was overtaken by a natural disaster, which revealed that forest administration had lost effective control over logging. As a result of massive landslides that killed over 250 people in the southern province of Nakhon Si Thammarat at the end of 1988, the government announced a ban on all commercial logging in the national forest. The cause for these landslides was immediately attributed to forest clearing for rubber plantations, but more detailed surveys identified that a combination of rock type and prolonged weathering were the underlying reasons, triggered by the ferocity of storms (MCKINNON 1997,123). On the positive side, there was a rethinking of forest policy and the development of a master plan was initiated with foreign assistance to deal with various sectoral problems. A part of this change has been the involvement of local communities in forest protection, first by means of a Forestry Extension Program in 1988. This was followed by a proposal from RFD for a Community Forestry Act in 1991, which intends to classify certain parts of reserved forests as community forest allocated to a particular village,

though villagers will not have ownership rights or rights to settle. Village committees are expected to set forth their own regulations for sharing forest produce as well as timber harvest that is taxed if sold. (AMORNSANGUANSIN 1992,43). However, the act proved to be highly political and has still not been passed by parliament.

This very promising development was accompanied by a renewed forceful resettlement. The Forest Land Resettlement Program *('Khor Jor Khor'*) launched in 1991, largely organised by the Thai army, attempted to move farmers from degraded forest reserves to allow industrial plantations under the guise of reforestation. Most of those evicted were to be resettled in other areas, oftentimes in forest reserves and other areas already occupied by other farmers who were expected to give up their land (RFD 1993,vol.7,16). This needs to be seen in the wider context of the military coup of February 1991 that revealed the military involvement in commercial plantations, which even extended as far as the UNCED Conference of 1992. Thailand vehemently opposed the internationalisation of forest management in the form of a treaty as part of the Group of 77 (ENGLAND 1997,66). This programme underscores the lack of consideration for rural forest communities at that time. The programme met with extensive local resistance and was finally revoked in 1992 after the reinstatement of civilian rule, certainly influenced by the military bloodshed in response to the public riots of May 1992. However, in that same year the Forest Plantation Act and the Environment Protection and Conservation Act were passed, revealing the dichotomy of policies once again by supporting forest exploitation in the name of industrial development on one hand, and on the other encouraging public environmental conservation while leaving out forest conservation (GANJANAPAN 1998,79).

The years 1992-1996 also saw the implementation of the 1st Master Plan for Highland Development and Narcotic Crops Control under the Third Army and COHAN as the national administrative body, while ONCB continued to be the coordinating agency for the 20 provinces in which hill tribes live, with respective provincial and district agencies. The focus of the plan was on the socio-economic improvement of hill tribes, settlement, community organisation and environmental conservation (RERKASEM and RERKASEM 1994,26). For this purpose, a highland community classification was to be carried out, distinguishing four groups of settlement potential for registration:

1. **Permanent village**: large community of more than 50 households with permanent settlement and no migration for 20 years. Suitable for permanent agriculture and outside watershed class 1 or wildlife areas, government agencies are present and access by car is possible;
2. **Potential for permanent settlement**: no threat to national security, 20-50 households, no migration for 10 years, permanent houses and suitable for permanent agriculture;
3. **No potential for permanence**: lacks one of group 2 properties;
4. **Special**: special community (not further defined).

In order for a village to be legalised, it must be officially registered in the Village Directory of the Department of Local Administration (DOLA, Ministry of Interior), where it obtains a village number and Thai name (AGUETTANT 1996,50). It must also have a village committee, chaired by a headman (*Puu Yai Baan* in Thai) with two assistants, one in charge of community defence and the other of village management. The committee is subdivided into work sections in groups like the Savings Group, Agriculturists Group, Women's Group, Youth Group etc. Villages with official status are called *"core"* or *"key"* villages, while smaller settlements are called *"satellite"* villages and must use the identification of the *"key"* village they are attached to for all official matters. When the village population reaches 400, it may be divided and the new village first becomes a *"satellite"* of the existing village, a status that can be subsequently upgraded to *"key"* village in time. Legalisation is based on five conditions:

1. The community must not be a threat to national security;
2. The community has several active government agencies permanently in the village. The community has accepted the development initiatives and can support them;
3. The village and fields must be in zones suitable for settlement and permanent cultivation as per government concession, with considerations for natural resources and the environment;

4. The village has to be in line with the Local Administration Act of 1914 and the voluntary self-protection law of 1979;
5. The community has at least 50 households and has not moved in the last 10 years. In addition the inhabitants have to practice permanent agriculture with soil and water conservation measures.

As of 1993, DOLA had officially recognised 1,178 highland villages, while the remaining 2,187 communities were recognised as *"satellite"* villages, and there are about 35 % *"key"* hill tribe villages. (AGUETTANT 1996,58). Registration also extended to the household level in a two-step process, first by classifying hill tribes and then issuing identity cards as evidence of citizenship in order to help them to overcome restrictions due to lack of nationality like no access to higher education, voting, land nor free movement between provinces. First a household card known as *"Blue Card"* is issued, listing household members with all particulars including duration of settlement; then a yellow TR-13 is issued to illegal residents, while a white TR-14 card is issued by the local DOLA for Thai citizens after approval of the application. This was initially issued by the provincial governor, but the issuing authority was changed to district chief on 1 June 2000 (THE NATION 2000). The second step is the acquisition of citizenship with the TR-14 card prior to the end of the next master plan period (AGUETTANT 1996,60), a complex procedure emphasising permanent settlement and close cooperation with government agencies. The more than 30 % of hill tribe people who still do not hold Thai nationality face serious difficulties to integrate into Thai society. It may be argued that the processes of registration and provision of citizenship are the first steps towards highland development, precluding village development and any form of land use planning. As time evolved, DOLA became more important, while DPW as the original agency for highland development lost importance, funding and was transferred to the Ministry of Labour and Social Welfare in 1993.

While the master plan was implemented, the 7th NESDP (1992-1996) proposed that 25 % of the country should be protected as conservation forest, which means all of the nation's remaining forests (RERKASEM and RERKASEM 1994,27). At the same time 45.9 % of the country were classified as national forest reserve by the new Watershed Act of 1993, made up of 27.5 % conservation forest ("C") and 16.2 % economic forest ("E"), as well as a fraction of 2.2 % for agricultural production ("A"), while the watershed classification of 1983 remained unchanged. This was the first time that the government set a targeted area of conservation forest higher than the existing forest cover, which automatically brought back the threat of relocation from national parks and wildlife reserves (GANJANAPAN 1998,73). There are many examples in which swidden land was taken away for reforestation, particularly where new national parks were established. 1993 also saw the birth of another major forest planning policy in the form of the Thai Forest Sector Master Plan (TFSMP) with foreign support. The new plan shifted towards participation in stating:

"Local communities and individual villagers will have decision-making powers entrusted to them concerning the forest resources they depend on" (RFD 1993, vol. 2,3).

However, this remained a utopian objective with unrealistic expectations, which is why the plan was never implemented because (JANTAKAD and GILMOUR 1999,98):

- The plan did not pay sufficient attention to broader sectoral issues;
- It was not sufficiently flexible for changing interests in forest management such as the shift from exploitation to conservation;
- The policy process was too technically driven and lacked effective participation of key stakeholders.

4.2.2 Community forestry and decentralisation

Ever since RFD started to draft a Community Forestry Act (CFA) in 1991, the issue of forest conservation policy has become very political. More awareness and critical debate have highlighted the growing dichotomy between policy enforcement on some groups like minorities in the highlands and poor villagers in the lowlands on one hand, and favouritism towards business interests like the Forest Industry Organisation (FIO) on the other hand. While it may seem that the concept of communities managing their own forests is new to Thailand, in reality it has a long history, particularly in the north. As early as the late

13th century AD, sacred forests protected by watershed spirits are part of the law of King Mangrai, with over 300 systems of local forest control evolving subsequently (GANJANAPAN 1998,78). Traditional Thai systems distinguished between three types of community forest:

1. Sacred forest reserved for ceremonial purposes in accordance with guardian spirits, usually biologically rich as utilisation is prohibited (*pa phi* in Thai);
2. Watershed forest at the head of watersheds from which they draw their water supply (*pa ton nam*);
3. Communal woodland for specific utilisation such as grazing and harvesting of forest products *(pa chai soi*).

What is interesting is that these systems have strong parallels with hill tribe systems, particularly with the Karen (TRAKARNSUPHAKORN 1997,214) and to a lesser extent with the Lahu (GANJANAPAN 1997,248). This is important in that there is no need to invent new concepts, instead it is possible to build upon local traditions. The Community Forestry Act has been passed as a bill by the cabinet on 5 October 1999, but still has to be passed by parliament to become law (BANGKOK POST 1999). Indigenous classifications done by villagers as the primary stakeholders may prove to be more sustainable than those imposed by government agencies using physical features only. In the ongoing debate on community forestry it is useful to pinpoint conditions for a community to look after its own forest resources, summarised below irrespective of ethnicity (PUNTASEN 1997,78):

1. There must be a strong sense of community within the kinship group, mutual assistance like labour exchange and common practices;
2. There should be mutual benefits for the common users of forest, water and land resources;
3. Forest, water and land resources need to be well preserved through maintenance of the community forests;
4. The community requires a strong leader with wisdom and vision to adopt existing local practices to the changing situation;
5. There must already exist some forms of people's organisation in the community, such as a village committee for forest conservation;
6. There must have been a long tradition in recognising resources as the collective property of the community;
7. The community must be in a state of permanent settlement with criteria of social composition and sustainable levels of resource use;
8. The community must have a prevailing resource utilisation network.

The implementation of the 7th NESDP (1992-1996) with its focus on human resource development was a precursor to a reform of the administrative system in 1994, called the Tambon Council (TC) and Tambon Administrative Organisation Act (TAO, *Tambon* means sub-district in Thai) under the Ministry of Interior (MOI) and effective from March 1995 (PUNTASEN 1997,74). Although the TC was originally created in the late 1950s as the smallest administrative unit in order to propagate democracy at grass-roots level, in practice it was administered locally by the provincial administration and thus had no independent legal status. In contrast, the new TAO is made up of the Tambon Chief (*Kamnan* in Thai), the village headmen (*Puu Yai Baan*) and the Tambon Health Officer. This group of automatic members is supplemented by two other members elected by each village, which is a further step towards democracy (Figure 4-1).

TAO Council: Governing body and composed of the Tambon Chief (*Kamnan*), all village headmen, the local Health Officer and two elected members from each village. Responsibilities include economic, social and cultural development as well as natural resource management at village and Tambon level.

TAO Committee: The administrative section is chaired by the Tambon Chief (*Kamnan*), two selected village leaders and four people selected from the council members.

Office of the TAO Clerk: Administrative support, procedures and records.

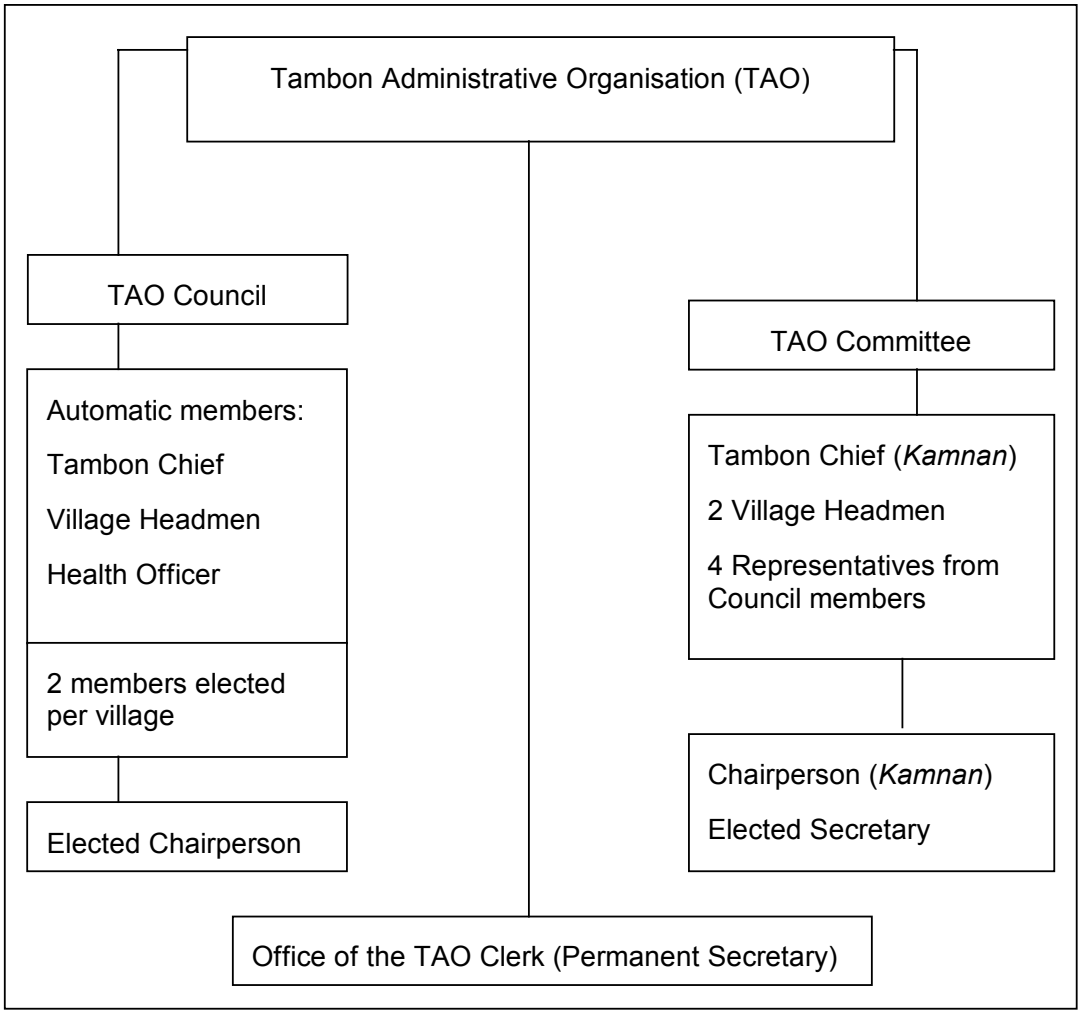


Figure 4-1: Structure of the Tambon Administrative Organisation (adapted from PUNTASEN 1997,75)

When the TAO legislation was approved, 2,760 new TAOs were created as corporate bodies with administrative autonomy, and overall there are over 6,400 TAOs nationwide compared to around 500 TCs. A Tambon Council with an average income of 150,000 Baht per year for three consecutive years is entitled to become a TAO, and the aim is to convert all TCs to TAOs. Funding initially mainly comes from the provincial administration and the Ministry of Interior (MOI), yet in future more revenue is expected from utility services like water works, garbage disposal and taxes. However, the management of revenue and their accountability have not been specified.

The sub-district council is often seen as a symbol of decentralisation, but there remain some doubts about the viability of TAOs given the centralised government system summarised below (NELSON 2000,17-21):

1. **Central control**: The Tambon Chief, as the most important administrative officer, continues to be appointed by the Ministry of Interior (MOI), which raises questions to what extent the government is ready to relinquish central control.
2. **Too many duties**: Many duties have been assigned to TAOs, categorised into economic, social and cultural mandatory duties covering the maintenance of roads and waterways, health services, education, religion and culture, the development of women, children, youth and elderly, and also the preservation of natural resources. These are formidable tasks and their

implementation remains a challenge, since district development and agricultural officers have not been mandated to the TAO.

3. **Great diversity**: TAOs vary greatly in area, population and income, thus covering a wide range of settlement patterns and economic structures. It has been proposed to divide them into more homogenous units for easier administration. Additionally, the transfer from regional administrations to TAOs has not been clearly mandated, leaving room for manipulations.

Although the TAO act is well intended, there remain some controversies. On the one hand it gives legal power to the community and direct administrative access to provincial funds and conflict settlement. On the other hand it eliminates all forms of traditional leadership as registered villages are integrated into the Thai administration. Thereby hill tribe village representatives find themselves caught between cultural traditions and Thai administration. On a wider scale the right of communities over forest and agricultural resources, particularly in official forest reserves, is an issue that the TAO act leaves open. There is no representation from the Royal Forest Department (RFD) and the Department of Land Development (DLD), yet they are key institutions for natural resource management. It is not clear how the forest sector should relate to TAOs for discussions and planning, which means that there still is no platform for a meeting of bottom-up planning and top-down decision making in natural resource management. Thus without land security the fear of eviction remains, which is a stumbling block to labour-intensive and costly long-term soil and water conservation measures as well as communal forest management. While the TAO act has provided civil incentives for village registration, it does not resolve the forest and land status.

4.2.3 The Second Highland Master Plan and a new constitution

The implementation of the Second Master Plan for Highland Development and Narcotic Crops Control (1997-2001) did not show major changes from the first one, though it mentions implementation problems such as a lack of coordination among agencies, restrictive forest policies, a slow citizenship process, and a lack of planning meetings between provincial and local organisations. The objectives are to accelerate the citizenship granting process (650,000 people still not Thais), to reorganise the administrative structure for easier implementation, and to promote people's participation in development as well as environmental conservation (RTG 1997,4). The implementation is done by means of three strategies:

1. The creation of security for highland communities;
2. Management of natural resources with a focus on people and forest living together;
3. Economic diversification and land use boundaries. This strategy emphasises administration for cooperation with the government and private sector. It also stresses the importance of the demarcation of a village land use boundary for planning, temporary residence and relocation. One change from the First Master Plan is that instead of merely resettling villages that have not yet been legalised, government support is intended for non-agricultural activities.

Village registration has proceeded and as of 1997 there were 4,374 highland villages, of which 48 % were *"key"* hill tribe villages (ADB 2000,5). In Mae Hong Son there are 648 villages, of which 268 (44 %) are registered *"key"* villages. Group classification in terms of potential for permanent settlement has proceeded (RTG 1997), and the lower figures for registered villages of 587 are due to the fact that the data for the plan was collected earlier than the subsequent review by ADB (Table 4-2). Mae Hong Son, as the most remote highland province, notably has the highest number of unclassified villages for northern Thailand (150 or 45 % of all villages). This may also be an indication for an unstable situation in terms of in migration as well as small and spread out communities.

Highland administration is carried out by eight Ministries (Interior, Education, Public Health, Agriculture and Cooperatives, Labour and Social Welfare, Defence, Internal Security, and Science, Technology and Environment) and 18 departments. While RFD continues to have the mandate to decide whether or not villages in group 2 and 3 can stay or will be resettled, DLD focuses on the identification and development of permanent villages. The Central Highland Committee continues to be in-charge overall, with the

Governor as head at provincial level, while at district level it is the district officer, and both belong to the Ministry of Interior. There is no mention of how this plan links with the TAO level, particularly important for planning platforms in controversial forestry legislation, hence the important administrative gap continues.

Table 4-2: Village classification of the Second Highland Master Plan (RTG 1997,7)

Province	Village group type for highland communities					
	Group 1	Group 2	Group 3	Group 4	Unclassified	Total
Chiang Mai	293	467	539	29	82	1,410
Chiang Rai	136	216	160	29	48	589
Nan	199	52	52	7	22	332
Mae Hong Son	228	78	116	15	150	587
Tak	151	113	221	13	25	523
Prayao	23	12	11	-	-	46
Lampang	15	25	45	-	-	85
Prae	22	24	4	-	-	50
Pitsanulok	52	3	1	1	-	57
Petchabun	27	9	54	4	-	94
Loei	4	31	5	-	-	40
Sukothai	8	10	-	-	-	18
Lampun	45	15	6	-	-	66
Kampaengpet	8	20	2	-	-	30
Uthai Thanee	16	16	5	-	-	37
Kanchanaburi	81	107	17	-	-	205
Petburi	7	13	2	-	-	22
Prachuab Kiri Khan	3	13	1	-	-	17
Radchaburi	11	44	16	2	-	73
Suphanburi	8	7	1	-	-	16
Total	**1,337**	**1,275**	**1,285**	**100**	**327**	**4,297**

Note: 327 villages are unclassified and are first placed in group 3. Categories: permanent village (group 1), potential for permanent village (group 2), no potential for permanent village (group 3), and special community (group 4).

The field research started under the influence of two major new developments in 1997: the 8th NESDP and a new constitution. The first important policy is the 8th NESDP (1997-2001), which marks a shift away from previous policies of accelerated economic growth at the expense of natural resources and low-cost labour towards sustainability and popular participation, and the summary recognises (NESDB 1997,2):

"It has become generally accepted that a process of development which disregards natural resources, human values and local customs and lore is antiethical to sustainable national development."

Nowadays the economic and social state of the people is considered as the main measure of success, so

that planning becomes more holistic. In order to achieve this, the emphasis lies on good governance by strengthening the relationship between the government and the people, and secondly on the implementation of administrative reform for decentralisation. The plan concludes with a chapter on the development of a monitoring & evaluation System in order to foster transparency, for which a nationally accessible database is to be set-up and indicators for development formulated (NESDB 1997,148):

"To create an effective and efficient monitoring and evaluation system, indicators must be at many different levels and relate to the different dimensions of the development process, in such a way as to be consistent with a modern managerial scheme. Popular participation will also be essential."

The second policy is the new constitution of 1997 with new roles for the government, towards more cooperation with and support of local communities, participatory planning and decision-making, as well as the development of the network on natural resources and data dissemination. Local communities shall be made more aware of environmental preservation and local administration via the implementation of the constitution, as stated in the clauses (JANTAKAD and GILMOUR 1999,99):

Clause No. 46: *"Communities shall have the right to preserve and restore the traditional culture, knowledge and fine arts of the local community and the nation, and participate in the management, maintenance, preservation and utilisation of natural resources and the environment in a balanced way, as provided by law."*

Clause No. 78: *"The state authority shall be devolved to local communities, so that they can depend upon themselves, can decide their own activities, develop a local economy and basic service system as intended by the provincial people."*

The new constitution caused controversy with regards to local administration, in that the TAO Council *ex officio* members (village and Tambon headmen) did not conform with power devolution. After some debate, these *ex officio* members were replaced by elected ones for four years in elections held on 18 July 1999 (NELSON 2000,19). There was considerable protest from village headmen throughout Thailand, yet this new political situation at communal level hardly affected hill tribes. For them TAO membership and local empowerment is a very new development, whose impact is only gradually internalised after decades of social marginalisation by the state.

Power devolution under the new constitution also affected popular involvement in forest management on a small scale, with pilot joint reforestation activities supported by the Royal Forest Department (RFD), summarised below (PRAGTONG 2000,4):

- Community forest and buffer zone pilot projects: implemented in forest reserves around national parks to enhance collaborative management between RFD and local organisations.
- Small-scale forest plantations: encourages job creation in rural areas, TAOs are given 10-20 ha for reforestation and are monitored by RFD.
- Forest fire protection: promotes people's involvement in forest fire protection, RFD supports TAOs in the development of fire protection plans.
- Joint forest management with TAOs: aims to develop procedures for local forest officers to work effectively with TAO administration to manage forest land.

Linked to forest management is the long-standing controversy over forest settlement, which is particularly relevant to the majority of hill tribes who live in forest areas. The field research was affected by a series of three cabinet resolutions in April 1997. The resolutions of 19 and 29 April 1997 allowed villagers who had been living in reserve forests prior to 1993 to remain there, on the condition that they take part in forest conservation. Proof of settlement for the first time took into account the village's history as well as the age of trees and buildings, and the government tried to settle land rights conflicts in 107 forest communities in the north and northeast. The third cabinet decision of 22 April 1997 is a general policy statement (EKACHAI 1998,11). These resolutions fitted in nicely with the pilot projects at Tambon level with support from RFD. Suddenly an atmosphere of openness was created and hill tribe villagers were ready to reveal their

modified system of land use for agriculture and forestry in the hope to eventually obtain long-term land security, and the issue of land titles resurfaced. At provincial level, RFD even formulated a proposal for the resolution of land use conflicts in conservation forests, pointing out that 70 % of the land is in *"perfect condition"*, meaning under forest cover (RFD 1997,1). The strictly protective RFD mandate for forests was softened, thereby allowing district officials to discuss community forestry directly with villagers, since they now had a legal basis for a conciliatory approach.

Unfortunately, policy decisions are easily overturned with changing governments and promising developments are inevitably followed by setbacks. The combination of the environmental and financial crises put an end to the new atmosphere of openness, for a logging scandal was exposed in April 1998 in the Salween forest of Mae Hong Son province. Provincial and district forest officials, as national guardians of the forest, had for years participated in illegal logging of mainly teak trees that were sent to Burma and re-imported as Burmese teak wood so as to bypass the logging ban of 1989 (KAOPATUMTIP 1998,1). The scandal led to a halt of settlement approval in the form of another cabinet resolution on 30 June 1998, which cancelled the three April 1997 resolutions regarding human settlement in forests (JANCHITFAH and CHINVARAKORN 1998,2). Policy for national forest management thus continues to be in a state of flux, though civil development makes evictions less and less likely as time evolves.

The most recent institutional development that might help to overcome differing priorities at Tambon level could evolve from the current restructuring project of the Ministry of Agriculture and Cooperatives (MOAC), as part of the ongoing process of decentralisation. A part of this reform at grass-roots level has been the introduction of Technology Transfer Centres (TTC) initiated in 1998, with 82 TTCs established nationwide by the Department of Agricultural Extension (DOAE), with the aim to cover all Tambons in the next few years (GTZ 2001,3). The organisational set-up of TTCs has been designed to operate under a committee that consists of (GTZ 2001,15):

1. District DOAE officer as Chairman;
2. Tambon DOAE officer as Secretary;
3. Members of other MOAC line agencies (RFD, DLD and DPW are important);
4. Members of the TAO;
5. Members of village committees (village leaders);
6. Farmer or farmer group representatives;
7. Leaders of occupational groups.

This initiative has been described as *"a shift from the previous top-down, blueprint approach to agricultural planning and management to bottom-up, participatory research, extension and service delivery"* (GTZ 2001,35). In principle this is a very laudable approach to decentralised natural resource management, yet based on previous attempts to set up new organisational structures it remains to be seen to what extent it can be implemented effectively and with considerations for local priorities.

4.3 Resulting key issues for natural resource management

Policy development for the highlands has continuously been in a state of flux between restrictive law enforcement and a gradual easing of central control in periods of openness. Some policies were directly targeted towards hill tribes, while others focused on the physical environments of forest and farmland only, whereby the social implications for hill tribes were often ignored. With changing policies, two main controversial areas remain, namely whether forest will still be state property or now become a common resource, and tenurial security with title deeds.

4.3.1 Types of land titles

When the Community Based Land Use Planning and Local Watershed Management (CLM) approach was initiated, it was assumed that at a later stage land titles would be allocated. This issue was repeatedly mentioned by villagers as a great disappointment after years of project activities that still do not give hill tribes any legal power to keep their land. The original land use planning proposal stated (MOHNS 1989,46):

"In the second step of land use planning the farmers will be promoted by the Land Use Planning Advisors to select up to 15 rai (2.4 ha) for permanent cultivation within areas classified as land capability classes I and II… If this procedure proves to be acceptable to the farmers and if sufficient land is demarcated as permanent – with the consequent abandonment of unsuitable areas – land use permits should be issued to the participating villagers."

Since none of the target villagers ever obtained a land title, one may conclude that the second step was never reached, or as the TG-HDP put it (ANONYMOUS 1998, vol.1,46):

"Despite its legal basis, there has been no political will to address the sensitive issue of land use rights in highland areas."

In spite of this unsatisfactory situation, it is nevertheless useful to examine the legislation for land policy as well as types of land classification to identify possible loopholes or even options for policy revision.

Historically, the evolution of individual land rights and enforcement mechanisms is the result of increases in population density relative to land availability. In Thailand, all land belonged to the king in the past, and this only started to change in the second half of the 19th century as part of a transition process from property rights in labour (slaves) to property rights in land (CHALAMWONG and FEDER 1988,125). This was initiated through exposure to international trade and the commercialisation of rice production, starting with the first title documents for rice land in the 1860s. In 1901 the Department of Lands (DOL, Ministry of Interior) was established to formalise title deeds. This process evolved till the formulation of a Land Code in 1954, which classifies land by soil fertility and land suitability, and used the first general soil map produced in 1953 as a basis (ARBHABHIRAMA et al. 1987,35). The Land Code defines three types of land documents corresponding to stages of land acquisition: occupancy, utilisation and legal possession. This starts a sequence of land occupation initially, with the aim to eventually obtain a full title deed. There are state and private lands, currently surveyed in a World Bank Land Titling Project from 1984 to 2004 (RATTANABIRABONGSE et al. 1998,20). Land is administered by 14 government departments in two ministries; the Ministry of Interior and the Ministry of Agriculture and Cooperatives (Table 4-3).

Table 4-3: Land distribution in Thailand (from RATTANABIRABONGSE et al. (1998,21)

Public Land Area (km^2)		Private Land Area (km^2)	
Forest Land	259,520	Title Deed	29,760
Government Real Estate	16,945	Certificate of Utilisation	103,040
Local Administration	4,800	Claim Certificate	12,480
Public Domain	42,560	Communal Lands	1,600
Total	323,825	Total	146,800
Undocumented Land: 42,240 km^2 (for redistribution by RFD, ALRO and DPW)			

State Lands: no single government agency is responsible for the administration of all state lands, there are 5 categories (including undocumented land) shown below:

1. Forest Lands; administered by the Royal Forest Department (RFD). 80 % of state lands and 50 % of the country fall under these, covering forest reserves, national parks, wildlife sanctuaries and agricultural land used by private individuals. Most highlands come under this category.
2. Government Real Estate; under the Treasury Department. Contains land used by government agencies, universities and schools, of which 40 % is allocated to the Ministry of Defence and 58 % for the use of other government agencies.
3. Local Administrations and State Enterprise Lands; administered by the above agencies and includes lands for religious purposes.
4. Public Domain; under the Department of Lands. This covers land for the common use of the public, wasteland, abandoned land and islands.

Undocumented lands: Included in settlement schemes operated by government agencies. In encroached forest areas, land that is privately cultivated can be given an STK-1 claim certificate by RFD or an SPG-401 claim certificate by the Agricultural Land Reform Office (ALRO), and both titles become interesting when they can be converted to a certificate of utilisation by DOL. For communal self-help projects the Department of Public Welfare (DPW) can issue NS-3 certificates. For cooperative settlements, the Department of Cooperatives Promotion can issue KSN certificates.

Private lands: whether held communally or by individuals, are either documented by titles under the Land Code or undocumented:

1. Title deed; (NS-4 from DOL) indicates full ownership and includes a deed utilisation plan with indicated boundaries.
2. Certificate of Utilisation; (NS-3 or NS-3K from DOL) proves that the person named as owner has put the land to use.
3. Claim certificate (STK-1 and NS-2); authorises temporary land occupation and a claim of a person who possessed the land and made use of it prior to 1981.
4. Communal lands; not further defined and proposed for community forests.

Land ownership has been a desirable goal for hill tribes for a long time, but initially they were excluded on the basis that they were not Thai citizens, and more recently based on the watershed classification that designates most highland areas as off limit. The renewed discussion on forest settlement and community forestry may change the situation. Options for modification include the allocation of undocumented lands for communal hill tribe settlements or even STK claim certificates for Thai individuals who have resided on the land since 1981, as in the concept of *Forest Villages* in the 1970s (HAFNER and APICHATVULLOP 1990,337), or the conversion of undocumented land to communal lands. However, this is a hypothetical situation that to date seems unrealistic given the lack of political will, but it could change to include hill tribes under the new constitution, if they have become Thai citizens.

4.3.2 Communal forest management

The long debate on community forest management, which is gradually increasing in intensity as well as peoples' organisations and finds support in the new constitution, can be perceived in terms of cultural dimensions of development approaches that have evolved over time. A short summary identifies three main development perceptions that have shaped the general public (GANJANAPAN 2000,3-5):

1. *Buddhist approach* (from 1960s): Buddhist monks were used as a tool for development, as intermediaries between government officials and villagers. This is a top-down approach in design and execution.
2. *Community culture* (late 1970s): NGOs and academics developed this school of thought, which idealises village culture as the driving force behind development, yet is too much anti-state.

3. *Community rights* (from late 1980s): This approach recognises indigenous culture and village life as a value system of rationality between individuals, society and nature. Popular participation is possible by recognising villagers' rights in their own organisations and in natural resource management decisions.

This latest approach is most relevant to the development of communal forest management and even includes the rights of hill tribes, thereby reducing the social barriers that dominated the past and encouraging their participation. There have been numerous attempts to formulate a Community Forestry Act (CFA) to provide a legal framework to peoples' participation, starting with the first one by the Royal Forest Department in 1992 (MAKARABHIROM 2000,2). While this first version focused on government reforestation schemes, subsequent *"People's versions"* focused on the recognition of local management systems, to the point of including shifting cultivation and traditional forest maintenance strategies. This is where the debate relates to hill tribes and their land management priorities, as they have become part of the general picture. Three interest groups dominate the debate: the government group, the community group of NGOs, academics and local networks, and the national group of environmentalists and urban people. The closer link between hill tribes and Thais is illustrated by their inclusion in the peoples' movements like the Northern Farmers Network in 1995 and the Assembly of the Poor in 1997. At national level, a Karen village elder has even become a member of the National Social and Economic Council, the highest planning commission (ODOCHAO 2001,11). The process has gone through a series of public hearings, and on 7 July 2000 the Parliament has approved the bill in principle and appointed a parliamentary commission to finalise the draft, but this does not yet guarantee that the process will lead to new legislation that is enforced.

As the debate is still in progress, resulting laws have not yet been defined, but three levels of management have been recommended that favour a complimentary role of stakeholders rather than a controlling one (MAKARABHIROM 2000,7):

1. *"National level: Community forestry policy committee to review legislation and issues arising in implementation.*
2. *Provincial level: Control, monitor and assist in implementation and resolution of local conflicts.*
3. *Community level: Community forest management committee acts as primary manager with support from the RFD and NGOs."*

In a complimentary approach, community forestry needs to take into account the reformation of the Ministry of Agriculture and Cooperatives (GTZ 2001) to meet new challenges of decentralisation and multi-stakeholder participation in forest management. Here RFD lacks the capacity and has too few resources to manage the process alone. On the other hand decentralisation is a gradual process and in a time of transition, where local communities need to learn communal management and joint planning with government agencies. An atmosphere of mutual trust and cooperation needs to be built up, so that constantly changing policies will become a thing of the past.

5 Land use planning in both survey areas

Nam Lang and Huai Poo Ling lie in Watershed Class 1, which means that all land has been classified as conservation forest (no cultivation or settlement permitted) by the Royal Forest Department (RFD). In addition, the southern 60 % of Nam Lang lie in the Pai Wildlife Sanctuary and are subject to severe scrutiny with regards to forest use. Nam Lang is the name of the watershed and was attached to the central district until it gained district status in 1996 and was renamed Pang Ma Pha, subdivided into the four sub-districts or Tambon of Pang Ma Pha, Tham Lod, Na Pu Pom and Soppong. Tambon Huai Poo Ling is one of five sub-districts of Mae Hong Son central district (*Amphoe Muang*), and one third of the area lies in the Nam Tok Surin National Park. The annual cultivation cycle is very similar in both areas (Table 5-1), whereby pioneer swiddening has nearly disappeared and now resembles a mixture of rotational swiddening with short fallows.

Table 5-1: The hill tribe cultivation cycle (RATTANASORN and PUGINIER 1998,359)

Month	Swidden Activities	Paddy Activities
January	Select swidden sites, start clearing forest	Level new fields, dig new ditches
February	Cut swiddens and burning	Same as January
March	Cut swiddens and burning	Same as January
April	Same as March, build huts, complete fencing, plant maize	Same as January
May	Complete maize planting, then follow with rice planting	Prepare, sow and weed irrigated nursery; after rains begin, repair dikes, plough fields
June	Start weeding highland fields	Plough and harrow depending on onset of rains, transplant seedlings
July	Continue weeding, harvest of the first vegetables	Completion of soil cultivation, transplanting and weeding
August	Continue weeding, vegetable harvest	Weed and make necessary repairs
September	Final weeding	Weed and general management
October	Rice ripens, some harvesting continues	Rice ripens, some harvesting
November	Harvest completion, carry rice to village	Harvest completion, carry rice to village
December	Finish carrying rice to village	Finish carrying rice to village

Pang Ma Pha district is more than twice as large as Huai Poo Ling with 881 km² (DLD 1983,5) as compared to 397 km² (ANONYMOUS 1991,5). Both areas are dominated by mixed deciduous forest, with smaller patches of hill evergreen forest in between. In both areas the soils are based on limestone, sandstone and volcanic rocks as parent material, thus giving rise to sandy loam, clay loam and clay soils of shallow to intermediate depth. The altitude ranges from 300 to 1,700 m, and the mean annual temperature lies at 24 °C, with maxima at 38 °C in both areas, while the minima in Nam Lang are slightly higher at 14 °C than in Huai Poo Ling with 6 °C. The annual rainfall average lies at 1,300 mm in both areas. Pang Ma Pha has experienced a strong population increase between 1983 and 1998, from 6,000 to now over 16,000 inhabitants, or in terms of population density an increase from 7 to now 18 persons/km². The population density in Tambon Huai Poo Ling has changed from 6 to 10 persons/km² from 1990 to 1998, or from 2,500 inhabitants to now over 3,500 inhabitants. This means that the pressure for land is less intense here as Huai Poo Ling has only just reached the population density Pang Ma Pha had back in 1983.

5.1 Pang Ma Pha district (Nam Lang)

When the TG-HDP started activities in Nam Lang, a land capability classification was carried out by the Department of Land Development (DLD), which proposed a reduction of identified forest areas from 82 % to 64 % in order to promote agricultural development (DLD 1983,24). Agricultural areas were meant to be increased from 4 % to 12 % of the surface area, further supplemented by agroforestry (Table 5-2). It needs to be added that agricultural areas meant permanent farming only, and not shifting cultivation!

Table 5-2: Land capability classification for Nam Lang (Source: DLD 1983,24)

Land use in 1983	Area (ha)	%	Potential land use	Area (ha)	%
Agricultural areas	3,512	4.0	Agricultural areas	10,587	12.0
Abandoned farm land	10,585	12.0	Orchards/tree crops	20,787	23.6
Deforested areas	348	0.4	Forestry	56,740	64.4
Rock outcrops	1,497	1.7			
Unclassified areas	204	0.2			
Forested areas	71,968	81.7			
Total	88,114	100.0		88,114	100.0

A subsequent survey of land use changes over a period of 11 years has been carried out using satellite images by DLD to serve as qualitative indicators for further assessment and planning on the improvement of the forest resource base (TANSIRI et al. 1995,1). Seven types of land use were identified (Table 5-3), where forestlands include natural forest, bamboo forest, secondary forest and forest plantations.

Table 5-3: Land use change in Pang Ma Pha district (TANSIRI et al. 1995,7)

Vegetation	Area in 1983			Area in 1994		
	rai	ha	%	rai	ha	%
Urban land	478	76.5	0.26	1,117	179	0.60
Paddy	713	114	0.38	2,214	354	1.20
Swidden fields	7,659	1,225	4.14	12,614	2,018	6.81
Bush fallow	22,209	3,553	12.00	17,641	2,822	9.53
Orchards	-	-	-	251	40.2	0.14
Natural forest	143,379	22,941	77.46	111,649	17,863	60.32
Bamboo forest	2,047	328	1.10	24,885	3,982	13.44
Secondary forest	1,883	301	1.02	7,340	1,174	3.97
Forest plantation	-	-	-	657	105	0.35
Rocky land	6,730	1,077	3.64	6,730	1,077	3.64
Total	185,098	29,615	100	185,098	29,615	100

Note: 1 rai = 0.16 ha

Rocky land remains unchanged, while urban land has increased. The survey did not cover the whole of the district, but serves to show that land use has changed over 11 years in such a way that the patchiness of forest areas increased. Paddy cultivation areas have increased only slowly, understandable since irrigation facilities are costly investments for farmers. Swidden fields have nearly doubled in area as land use intensifies, while bush fallows decreased with time. Perhaps as an effect of the TG-HDP, orchards that did not exist in 1983 now cover an area of 40 ha. The most interesting aspect is the decrease in natural forest by 17 %, from 77 % in 1983 to 60 % of the area in 1994, and this trend is likely to continue. Bamboo forests have increased from 1 % to 13 % during the same time, because they developed from bush fallow of abandoned arable land. These will become secondary forests if left undisturbed and are found near swidden lands close to villages. Secondary forest is found close to natural forest and has also increased, partly due to tree planting activities for watershed rehabilitation. The loss of over 5,000 ha of natural forest is remarkable and is likely to continue as agricultural cultivation expands. The satellite images have been processed for graphic display of land use in the years 1983 and 1994 as illustrated below (Figure 5-1 and 5-2). This survey illustrates an overall picture for Pang Ma Pha district, and land use was examined more closely at village level in Tambon Pang Ma Pha only, as all the four selected villages lie in the same Tambon. The current population of this Tambon is around 2,600 people.

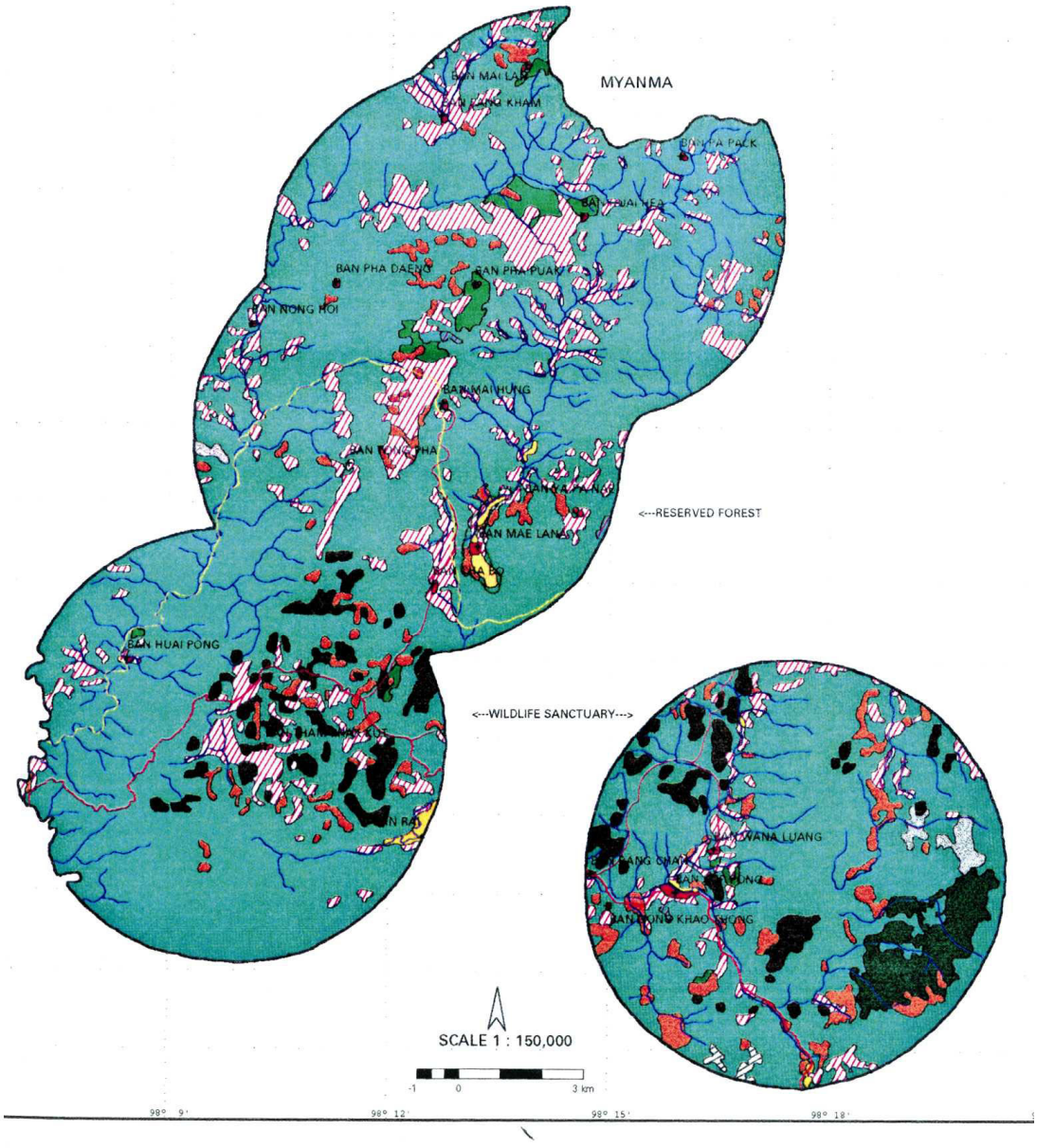


Figure 5-1: Land use map of Nam Lang in 1983 (TANSIRI et al. 1995,8)

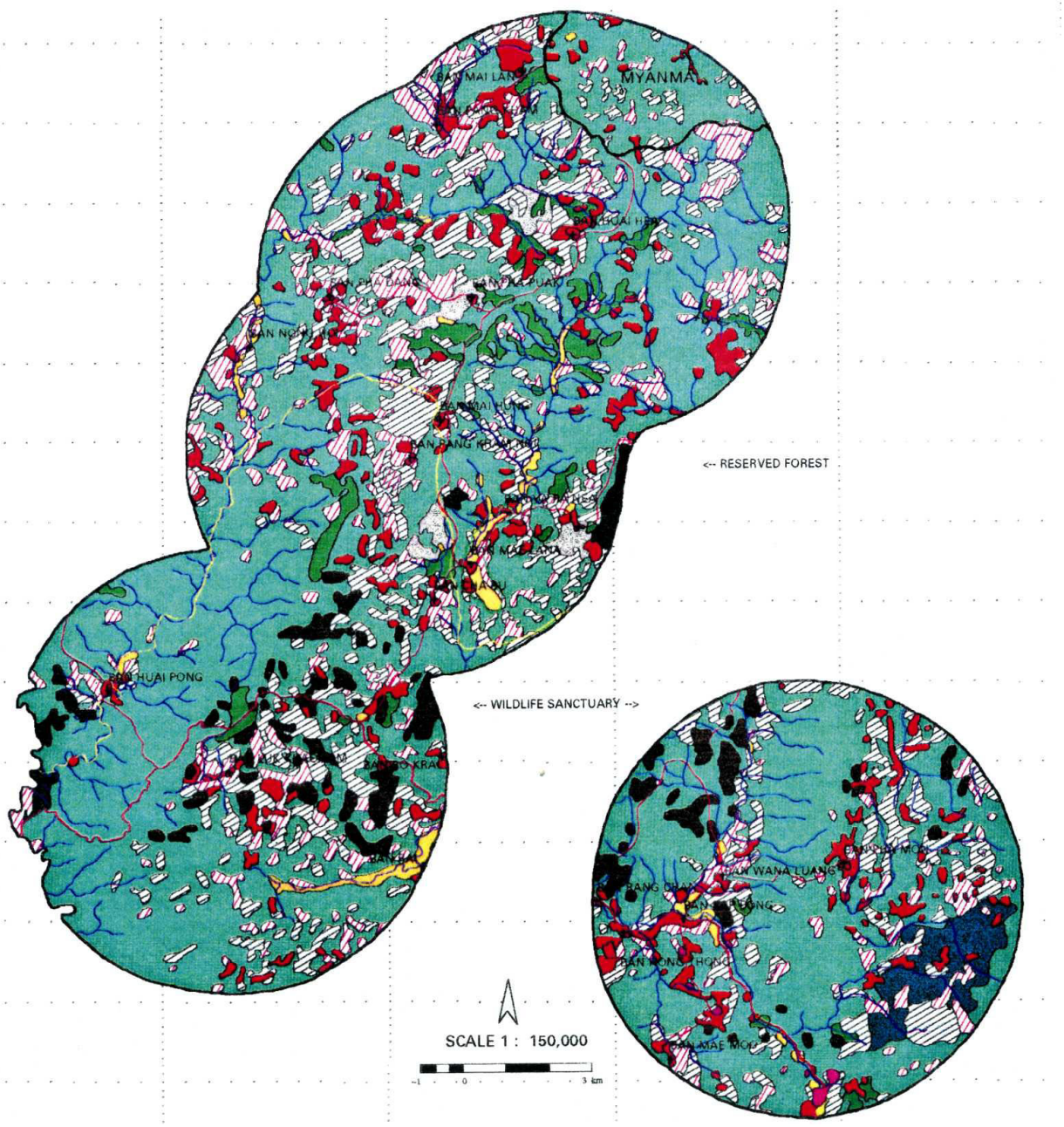


Figure 5-2: Land use of Nam Lang in 1994 (TANSIRI et al. 1995,10)

Legend

	Urban land		Natural forest
	Paddy fields		Bamboo forest
	Swidden fields		Secondary forest
	Bush fallow		Forest plantation
	Orchards		Rocky land

According to a Lahu village elder from Pa Charoen village, Lahus in Pang Ma Pha are the result of a *"voluntary village relocation"* by the Thai government in the early 1970s to create a concentrated Lahu settlement (Chapter 4.1.1). In the late 1970s the Royal Project took control over the area and set up a hill tribe settlement there, administered by the Department of Public Welfare (DPW). Pioneer swiddening was strongly discouraged by the government and replaced by permanent farming and small-scale irrigation. However, government support was only of short duration and, under the influence of the first watershed classification in 1975 (TANGTHAM 1992,4), Nam Lang became part of the new policy of *"Forest Villages"* in degraded forest areas (Chapter 4.1.3), to the point that land was taken away from Lahus and given to Thai squatters. The support from DPW was gradually reduced as forest issues dominated, hence the area was always referred to by the name of the watershed and not its Lahu name *"Nolaen"*, while Lahu farmers were left to their own device. Perhaps this played a role in the choice of Nam Lang as a project area of the TG-HDP. Northern Thailand was divided by intervention areas for development projects, yet documents point to opium cultivation as one of the main reasons for its selection (ANONYMOUS 1998,vol.1,3).

5.1.1 Pa Charoen village

Pa Charoen is a small Red Lahu (*Lahu Nyi*) village (77 people) of 48 ha and a *satellite village* of Ya Pa Nae (*key village* No. 5), established as a settlement in 1987. As a *satellite village,* Pa Charoen has no official status, nor is it a member of a Tambon Administrative Organisation (TAO). Under the Highland Master Plan it was categorised as a Class 1 (permanent village) by the Department of Land Development (DLD 1994). It is the only surveyed village that has converted to permanent farming due to a lack of land for swiddening and has received support for the setup of soil and water conservation structures and fruit trees by the TG-HDP (Photo 5-1). Villagers have 2-8 fields of 0.5-4 ha in size, on slopes ranging from 16-60 %, covering a total area of 38 ha according to an RFD survey in 1998. Apart from firebreaks, the village does not have natural resource use regulations. When the villagers settled, the village committee divided land according to family size and food need. There is no paddy cultivation due to unsuitable land, but neighbouring Mae Lana and Ya Pa Nae enable some paddy cultivation. Upland rice is the most important crop, followed by maize for consumption. Pa Charoen was part of the TG-HDP promotion of perennial crops (BOURNE and WOOD 1991,41) like Japanese Apricot (*Prunus armeniaca*), Peach (*Bactris gasipae*), Macadamia Nut (*Macadamia integrifolia*), Persimon (*Diospyros virginiana*), Passion Fruit (*Passiflora grandis*) and Coffee (*Coffea robusta*). The German MSc study found that fruits are still the main cash crops to buy rice to meet its food needs (KLIMKEIT 1999,56), but there is severe competition in marketing.

Photo 5-1: Helicopter view of Pa Charoen village

The first topographic clay model was built in 1992 (already destroyed), and just before the TG-HDP closed a new one was built with Styrofoam in May 1998, but the cultivation areas were not marked (Photo 5-2).

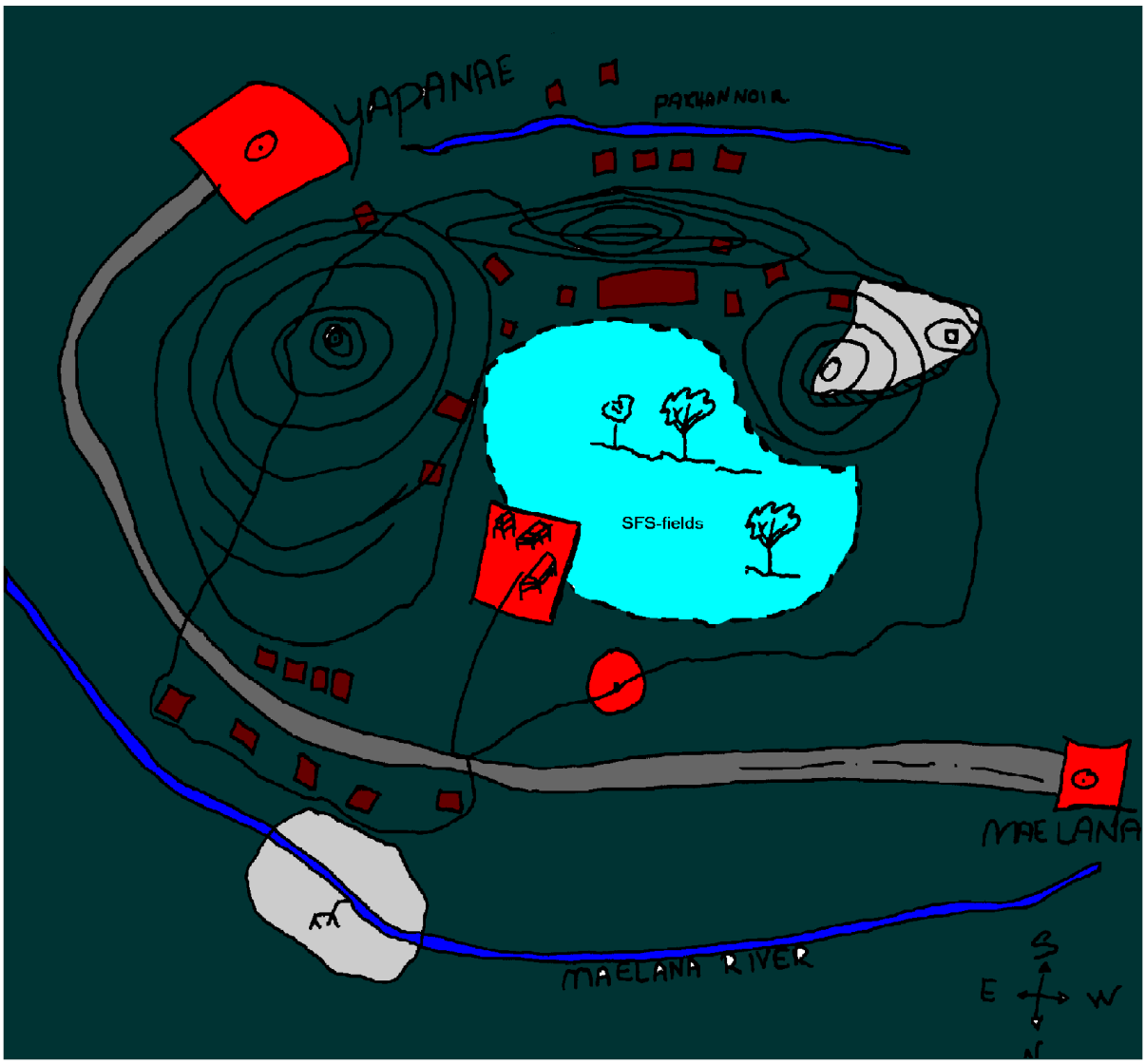
Photo 5-2: Incomplete land use model built by the TG-HDP in May 1998

A village map was drawn with village leaders and translated into English below to document land classification (KLIMKEIT 1999,32). Farmers placed permanent fields labelled Sustainable Farming Systems (SFS-fields) at the centre (Figure 5-3), included rice fields, the cattle grazing areas, and surrounding forest. The map shows the influence of the land use planning approach of the TG-HDP in terms of area demarcations, contour lines and even a black line surrounding the village like an outer user boundary, yet the fact that some fields lie outside this boundary was not an issue for villagers.

The assistant headman holding the model has a bleak vision of the future, based on the high population density of 160 people/km^2 as stated below:

"The villagers feel that they are slowly strangled by population growth and a decreasing soil fertility".

Pa Charoen made a very impoverished impression, and the greatest problem mentioned by farmers was insufficient land, so that villagers work outside as labourers to make a living. In this situation, with all suitable land already under cultivation, topographic models and digitised maps do not seem to be of any use for farmers given the shortage of land, and the fact that villagers have not demarcated land use on the model is a mixture of inability to do so without external support as well as little usefulness to resolve pressing problems. In this context the assistant headman mentioned the dependence on Ya Pa Nae for all official matters as a stumbling block, since the village has no possibility to make its voice heard when seeking the support of government extension services or formulating requests for assistance in TAO meetings that have a mandate to include natural resource issues.



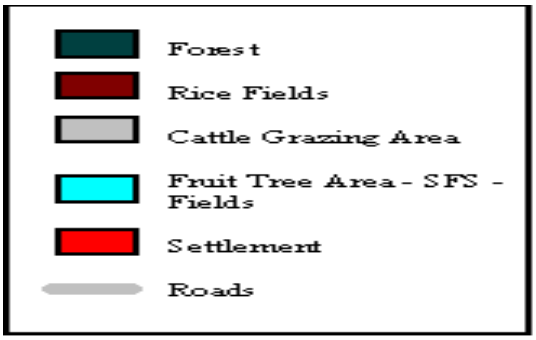


Figure 5-3: Land use map of Pa Charoen village (from KLIMKEIT 1999,32)

5.1.2 Huai Hea village

The 172 inhabitants (8 people/km²) of the Lahu Sheleh village Huai Hea became registered with the Department of Local Administration (DOLA) in 1987 as *key village* No. 8, although the Department of Land Development still placed it in class 3 as having no potential for permanence (DLD 1994). This is a strange contradiction between different departments in terms of the official village status. Huai Hea was established as a local settlement 50 years ago, when its people dwelt around the Mae La Na and Nam Pong watershed areas. Most settlers came originally from Sam Muen Mountains in Chiang Dao district,

Chiang Mai province, while some migrated from Doi Khu in Myanmar. The main reason for their migration was to seek fertile land for planting opium. The initial settlement was characterised by dwellings grouped in areas along mountain ridges over the streams of Huai Nam Pong and Huai Mae La Na. These streams, which served as a main source of water for home consumption (pipe water, irrigation system etc.), were situated about 3 km away from the nearest household, and the surrounding areas of the village were used for cultivation. The village was included in the TG-HDP Soil and Water Conservation (SWC) programme in 1987 and paddy fields were introduced. None of the villagers have any land documents. Under the influence of CLM the village land use map has been included on the Tambon model (Photo 5-3). The blank upper right of the picture demarcates land that already belongs to Myanmar and this proximity illustrates why some villagers still farm and collect forest products across the border.

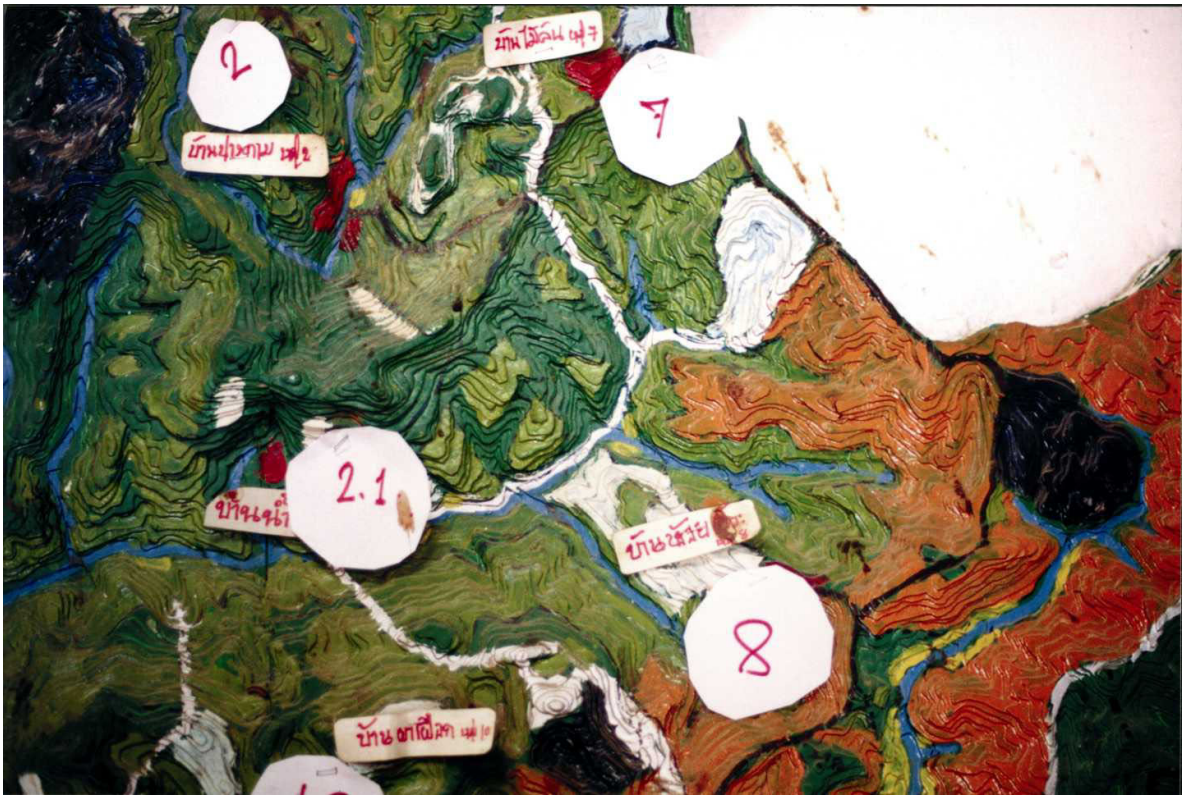


Photo 5-3: Huai Hea village on the Tambon model (village No. 8)

Since the inclusion of Huai Hea in the CLM concept 1994, farmers have reduced their number of plots which previously exceeded 10, and the fallow periods for upland rice have decreased from 7-8 years to 2-3 years, while lands in Myanmar will progressively be given up as land use intensifies and the Burmese Army is less tolerant towards illegal border crossings. Of a total area of 2,103 ha with an outer user boundary marked by villagers themselves, 67 % is marked as forest area, while about 33 % or 693 ha are used for agricultural purposes. It is the only surveyed village in Pang Ma Pha that has paddy rice, owned individually. Crops include maize and red beans on crop rotations, as well as vegetables and fruit trees. Villagers have 2-6 fields on average, ranging from 1-2 ha, with some land still in Myanmar. Huai Hea has even given three upland areas to a Karen woman that fled from a refugee camp, in spite of land scarcity. Parallel to this the upland rice harvests have gone down from 60 tang per 1 tang of seed to 15-20 tang (1 tang = 20 l container or 10 kg of milled rice). When selecting upland fields, any land fallow for 5 years can be used, there is no fixed ownership system. When looking for new fields, villagers rely on dreams to either confirm their choice if in the first night after selection they dream of water or reject it if they dream of metal, so these traditions continue to survive in spite of exposure to government extension systems.

When interviewed about the use of their model and the map (Figure 5-4), villagers pointed to the TG-HDP that provided the model and also mentioned that it has not been updated.

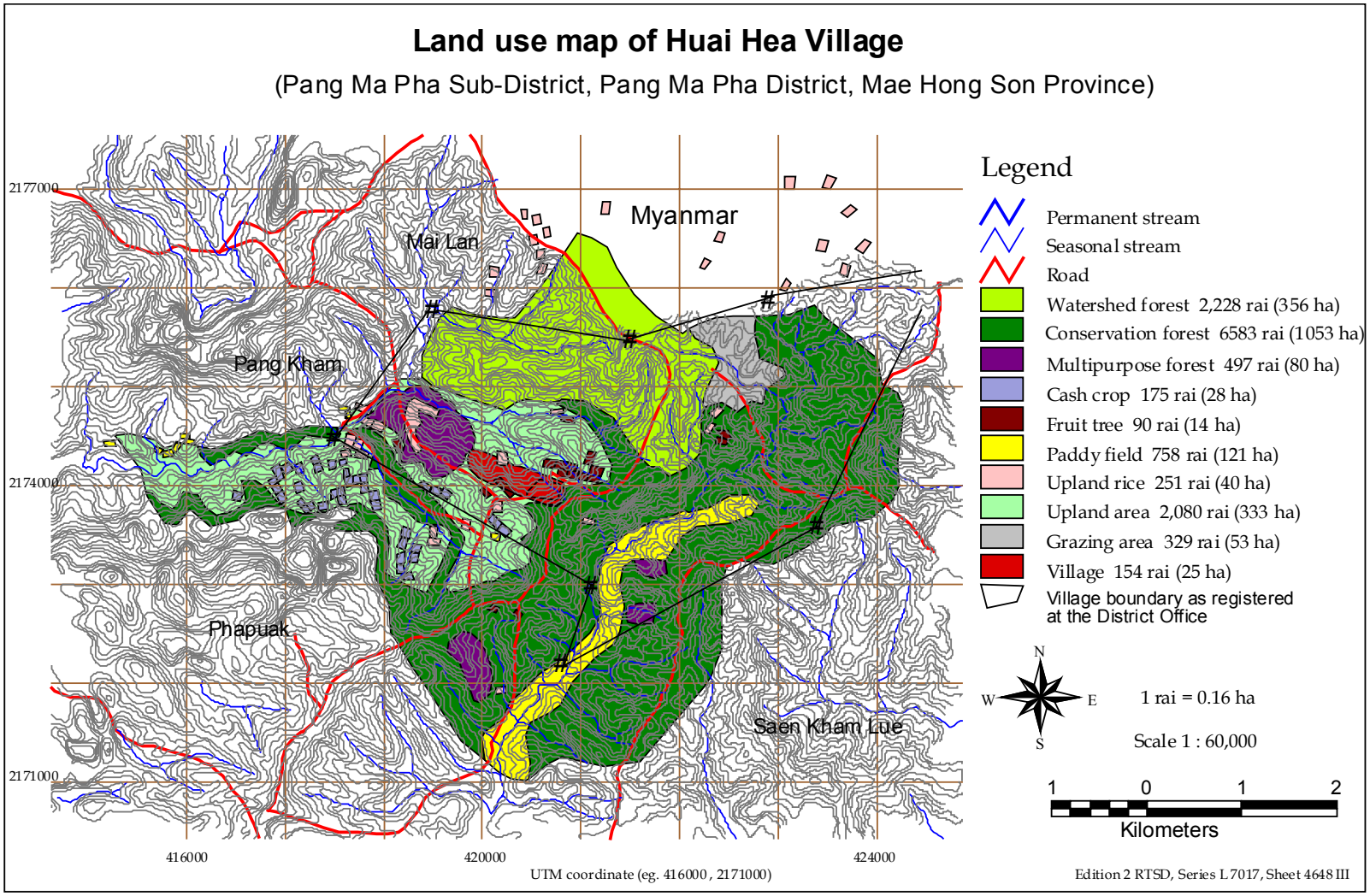


Figure 5-4: Land use map of Huai Hea village

Villagers feel that they lack the confidence to update it themselves and are concerned because their boundaries are not recognized. The land conflict with Phapuak village to the west was mentioned, where Huai Hea lost some upland to the newly established village when it was officially registered in April 1995 (DOLA 1995). Phapuak villagers originated in Huai Hea and migrated to form a new settlement, and at the time of village registration about 25 % of Huai Hea area was given to the new village and thus lost. The differences between the boundary drawn by villagers themselves and that of the registration document are clear when included on the map and caused some concern among village leaders, as neither the TG-HDP nor the DOLA office had informed Huai Hea of these boundaries. The village committee requested a copy of the registration document to better understand the boundary demarcation, but found it difficult to understand the specifications in the text. It was only the DOLA boundary was included in the digitised map in poster size that the extent of land loss was fully understood and caused quite some concern.

Other land classifications under the CLM approach were not recognized either and land demarcated as upland has even been confiscated by the Royal Forest Department (RFD), in spite of contrary statements from TG-HDP staff (JANTAKAD 1998,41). Huai Hea has therefore been hit hard by policy inconsistencies, and as long as it is officially still classified as having no potential for permanence by DLD, it has no organisation to approach anymore in the struggle for a *Land Deal*. Huai Hea really is in a very unstable situation as to which land can be farmed or used for firewood collection – a situation that is not at all conducive to planning. Under the CLM process, the village has produced land use regulations (Box 5-1).

Box 5-1: Huai Hea regulations on land use (from the village committee)

Do not cut trees and cultivate the land around the watershed area.
Do not cultivate the areas found in the multipurpose forest.
Cutting trees for sale is not allowed except for the construction or repair of village housing and fuel/firewood (fine 500 Baht, paid to village committee).
For the non-villagers who want to use trees in the multipurpose forest, permission must first be secured from the village committee.

The members of the Tambon Administrative Organisation (TAO) that has been in existence since 1997 do not yet normally use maps for meetings, partly because of their limited mapping skills and more importantly, because the issue of unclear boundaries has not been resolved by the TAO. The fear of losing land persists, and since the closure of the TG-HDP in 1998 villagers have to deal with authorities directly. Huai Hea has come a long way to modify its land use, adapt to soil and water conservation, and regulate resource management by formulating regulations on land use, yet these efforts are still not recognized by government agencies. In this kind of situation a participatory GIS can display the inconsistencies graphically and can generate printouts to document the problem situation to help farmers negotiate resource management with the government.

5.1.3 Luk Kao Lam village

The Lahu Sheleh village of Luk Kao Lam originated from neighbouring villages of Bor Krai and Cho Bo as villagers looked for new land to farm on. The slopes are steep with 16-60 % and the geology consists of steep limestone mountains surrounding the village. The village lies within the Lum Nam Pai Wildlife Sanctuary established by RFD in 1972, which means that settlement and farming are illegal. In spite of having been relocated under the Royal Project with an emphasis on permanent farming, farmers still practise shifting cultivation to a limited extent in a rotational form with ever-shorter fallow periods. Remnants of the original pioneer swiddening system include traditions for upland selection and knowledge of fertile areas that consider soil colour (red is good with few stones) and tree size. On a selected upland area a small offering is made to appease the forest spirits, and dreams during the first night will determine whether the land is kept (dreams of water) or rejected (dreams of metal). As part of the CLM approach, a village model was first built in 1995, but even the update does not include all fields as seen in the southwestern border (Figure 5-5).

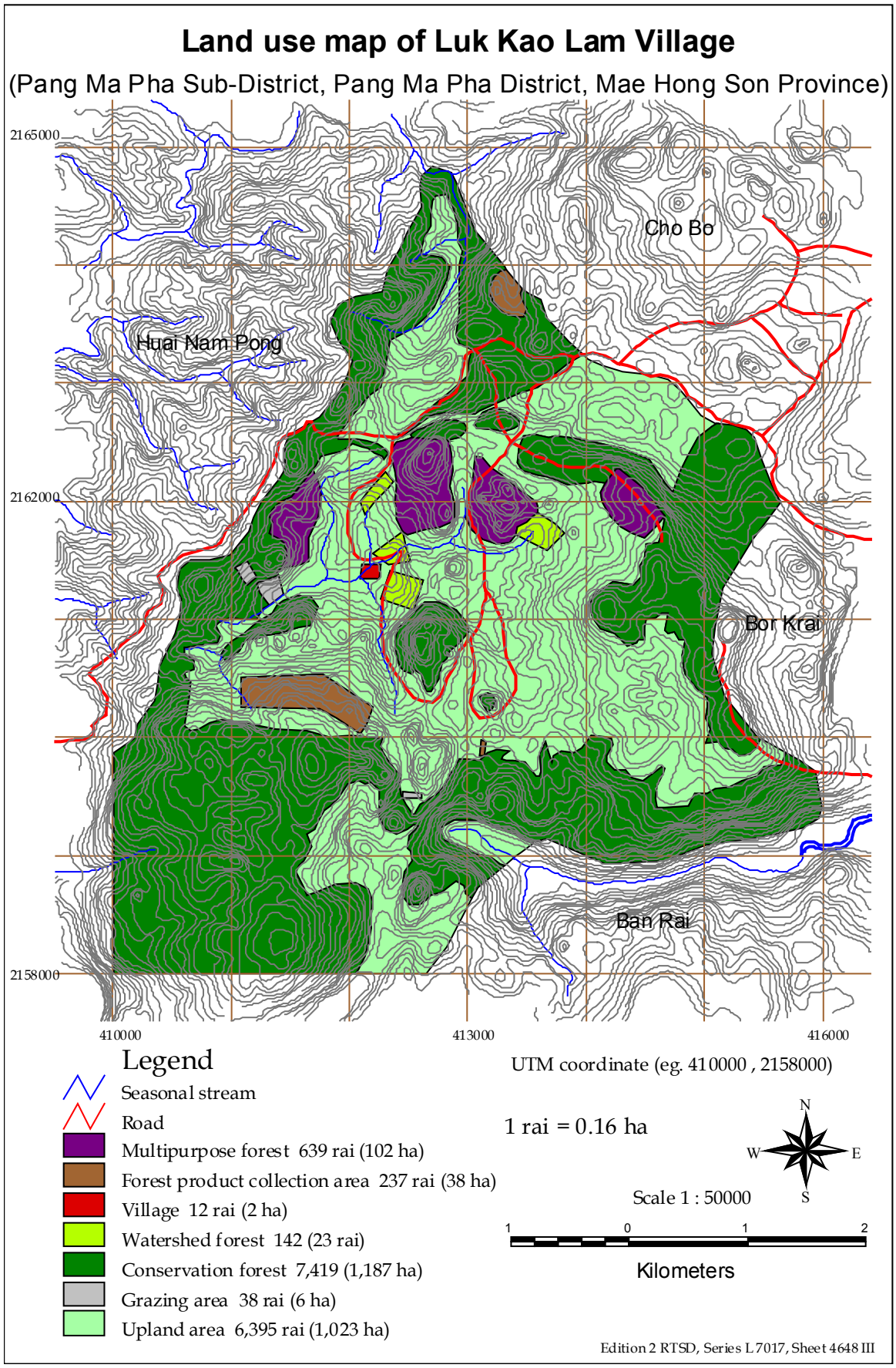


Figure 5-5: Land use map of Luk Kao Lam village

Given the insecure status of the village, the issue of an *outer user boundary* has not been too significant for the village, as everything could change at any time. The southwestern border thus became a straight line, as the model was too small. The TG-HDP underestimated the extent of the village and hence the model did not cover the whole area, and a revised model of 1997 did not correct that mistake. A rectification of the display would only become important to the village committee if it were coupled with land security, hence the proportion of cultivated area has been left out of the map on purpose. The total mapped area amounts to 2,381 ha with 278 people in Luk Kao Lam, resulting in a population density of 12 people/km^2. The village classification showed 43 % of agricultural land, while 57 % remain as forest. According to villagers' own indications 207 ha were cultivated in 1996 or about 18 % of the total village area, yet in a survey conducted by the district RFD office in which villagers were requested to specify the number and size of cultivated areas, a total of 394 ha were declared as under cultivation. At first the district forestry staff was reluctant to share the survey results, but became more cooperative when they obtained copies of digitised maps in exchange. The difference between actual and indicated land use was explained by villagers as a strategy for keeping land when dealing with RFD, since they expect land confiscation and can thereby at least secure some areas. The survey was conducted in an atmosphere of openness on the basis of the April 1997 cabinet resolutions granting forest settlement (see Chapter 4.2.3). RFD officials had often pointed to this resolution to display more tolerance towards the farming situation of hill tribe villages, and also confirmed the necessity for a mandate at national level for this approach.

A part of the CLM approach has been the diversification of agricultural subsistence to include non-wood forest products as cash crops, as well as a reduction of extensive swidden farming to protect forest cover. However, due to its location as an enclave surrounded by steep mountains the choices are limited, and RFD does not allow paddy rice cultivation due to its location in the Pai Wildlife Sanctuary. The livelihoods therefore depend on swidden rice farming rotated with maize and red beans, while taro is grown in the low lying areas together with cucumbers, and fruits, bamboo shoots and mushrooms as cash crops. Fallow periods are getting shorter here too, and rice yields are declining from 1 tang (20 l container) seeds yielding 60 tang to now only 30 tang. For reasons of wildlife protection the village had been included in plans for resettlement during the TG-HDP period (ANONYMOUS 1994,9), even though it was officially registered with the Department of Local Administration (DOLA) as *key village* No. 9 in 1988, and was classified as a class 1 village of permanent settlement (DLD 1994). It was not possible to obtain the boundary demarcations used by DOLA at the time of registration from the Mae Hong Son provincial office, so the discrepancies between land classification of the village and official registration could not be displayed. Villagers have always been in doubt about land security and have therefore expressed scepticism as to whether land use planning can help to overcome the difficult situation. Nevertheless, under the CLM approach land use regulations have been formulated by the village committee for tree cutting in conservation forest, with fines of 500-700 Baht depending on size, payable to the village committee and the requirement of committee approval for felling trees in watershed forest.

However, it takes more than one resolution to overcome a mutual lack of trust between villagers and RFD, and with a new cabinet resolution in 1998 that cancelled the previous forest settlement granting resolutions, the whole process is back in the air again. What the example also shows is that the Thai government continues to be centralised and that a real change to a more equitable relationship between primary and secondary stakeholders will only develop with a favourable policy framework. The purpose of detailed mapping for planning may thus be defeated in this case, as the situation of land insecurity persists. From the farmer's point of view it is perfectly understandable to give wrong indications in the confusion over how much land can be farmed, and whether areas will be reduced due to land confiscation by RFD in subsequent years. The state of policy uncertainty rather promotes instead of discourages such tactics to secure temporary land availability as part of the hill tribes' struggle for a *Land Deal*.

5.1.4 Bor Krai village (old name Cha-Aeu)

Of all the villages surveyed for this thesis, Bor Krai was the last one to become officially registered with DOLA, as *key village* No. 11 in 1996 (DOLA 1996), and was classified as a class 2 village with potential for permanent settlement (DLD 1994), which it has later become. At the time of registration a village is given a Thai name, hence the name of the former headman Cha-Aeu was changed to Bor Krai, a point illustrated here to show another facet of hill tribe integration. The Lahu Sheleh village has been inhabited for over 20

years and has reached a population of 169 or approximately 12 people/km^2. Interviews on the history revealed that villagers originated from Cho Bo village to the north and formed this new settlement in 1978. The main reason for the migration to Bor Krai was to find a new place to cultivate crops and raise animals, as with the rapid population increase in Cho Bo the land resources had reached their limits. Some villagers still have land in Cho Bo, but for official planning purposes this land is lost as it lies outside the boundary, unless the concept of a fixed boundary within which all land must be located is revised.

The farming system still has remnants of shifting cultivation, but under the influence of the CLM approach has been in a transition towards permanent agriculture. The geology of Bor Krai with limestone outcrops limits the land capability for cultivation and agricultural intensification, so increased livestock production of pigs and cattle is carried out to meet food demands. Farmers own 3-6 fields on average, of between 1-6 ha in size. Whereas previously fallow cycles lasted as long as 7-8 years, now they are reduced to 3 years. Upland rice harvests have gone down from 1 tang seeds yielding 40 tang to only 20 tang (1 tang = 20 l container). Villagers reported a lot of weed problems on upland fields, as the fires after shorter fallow periods are not hot enough to destroy weed seeds. Due to less fallow material accumulating, there is less burning material and fires are cooler. The debate on whether or not fires are a threat to sustainable planning is getting stronger in northern Thailand, yet a detailed survey has found that the most dangerous fires do not stem from controlled burning on hill tribe fields, but from forest fires that get out of control (HOARE 1998,5). The villagers have started some ecotourism on a small scale for additional incomes such as hosting guests and taking them to the nearby Fish Cave. The village has strict natural resource management rules (500 Baht/tree fine for felling and 500 Baht/animal for hunting in conservation forest). There is no paddy rice cultivation, because just like Luk Kao Lam village, Bor Krai is at the northern tip of the Pai Wildlife Sanctuary and thus paddy cultivation is forbidden by the Royal Forest Department (RFD), a severe constraint when trying to secure livelihoods.

Digitised land data from the village map was compared to the TG-HDP survey method (ANONYMOUS 1998,vol.2,29). There are differences between the two sets of data, and according to the TG-HDP, 37 % of the total area is used for agriculture, slightly less than the 43 % from digitised calculations (Table 5-4).

Table 5-4: Bor Krai village land use data from two sources

Land use categories	Area based on the village map (ha)	Area from TG-HDP Data ANONYMOUS1998,vol.2,29 (ha)
1. Community forest, including:	818	951
1.1. Conservation forest	656	878
1.2. Forest product areas	47	50
1.3. Multipurpose forest	115	16
1.4. Cemetery	not mapped	9
2. Agricultural area, including:	629	552
2.1. Area used in 1996	92	52
2.2. Livestock area	8	not mapped
3. Village	4	6
Total village area (1+2+3)	1,451	1,509
Agricultural area (%)	43	37
Forest area (%)	57	63

Note: 1 rai = 0.16 ha

Of that agricultural area, only an average of 12 % is actually burned and cultivated every year, while the rest remains as fallow. If one compares that to the total village area, then only about 5 % of the land is cultivated every year, a rather small amount that is placed under shifting cultivation. The greatest difference is found for conservation forest, with 878 ha in the TG-HDP survey compared to 656 ha from the digitised map that also showed 115 ha of multipurpose forest. The relevance of accurate area measurements depends on how data is used, as shown by the RFD land use survey conducted in 1997 under the same conditions as described for Luk Kao Lam village. According to the RFD district office, 179 ha of upland were used in 1996 or nearly double the measured value of 92 ha, which is explained by the same farmers' strategy of indicating more when facing land confiscation by the government. Mapping land use thereby acquires a new function of exposing conflicts and strategies of dealing with problems, and thus goes beyond the primary purpose of measurement.

As land use data was aggregated in the final CLM phase, it was included on the Tambon model of Pang Ma Pha. There is a discrepancy between village boundaries on the Tambon model and those on village maps. While at Tambon level the entire village extent has been demarcated (Photo 5-4), the village model cut off some land to the east. Yet this difference is relatively minor compared to the village demarcations when Bor Krai was officially registered (DOLA 1996), where unlike the general approach of reducing the extent of village areas, actually more land was attributed to Bor Krai (Figure 5-6). The village committee reacted with positive surprise and the map display generated discussions as to why the TG-HDP had not included the data on the model. In contrast to Huai Hea village, it was relatively easy for Bor Krai to agree on a joint boundary with Cho Bo as the village of origin. This is due to leaders of the adjacent Lahu Sheleh villages of Luk Kao Lam, Bor Krai and Cho Bo, who took their own initiative under the CLM approach in 1996 to initially form a group of forest product collectors with regulations mutually agreed by all parties. The network expanded to become the Pang Ma Pha Hill Tribe Network (JANTAKAD and CARSON 1998,6).

Photo 5-4: Bor Krai village on the Tambon model (village No. 11)

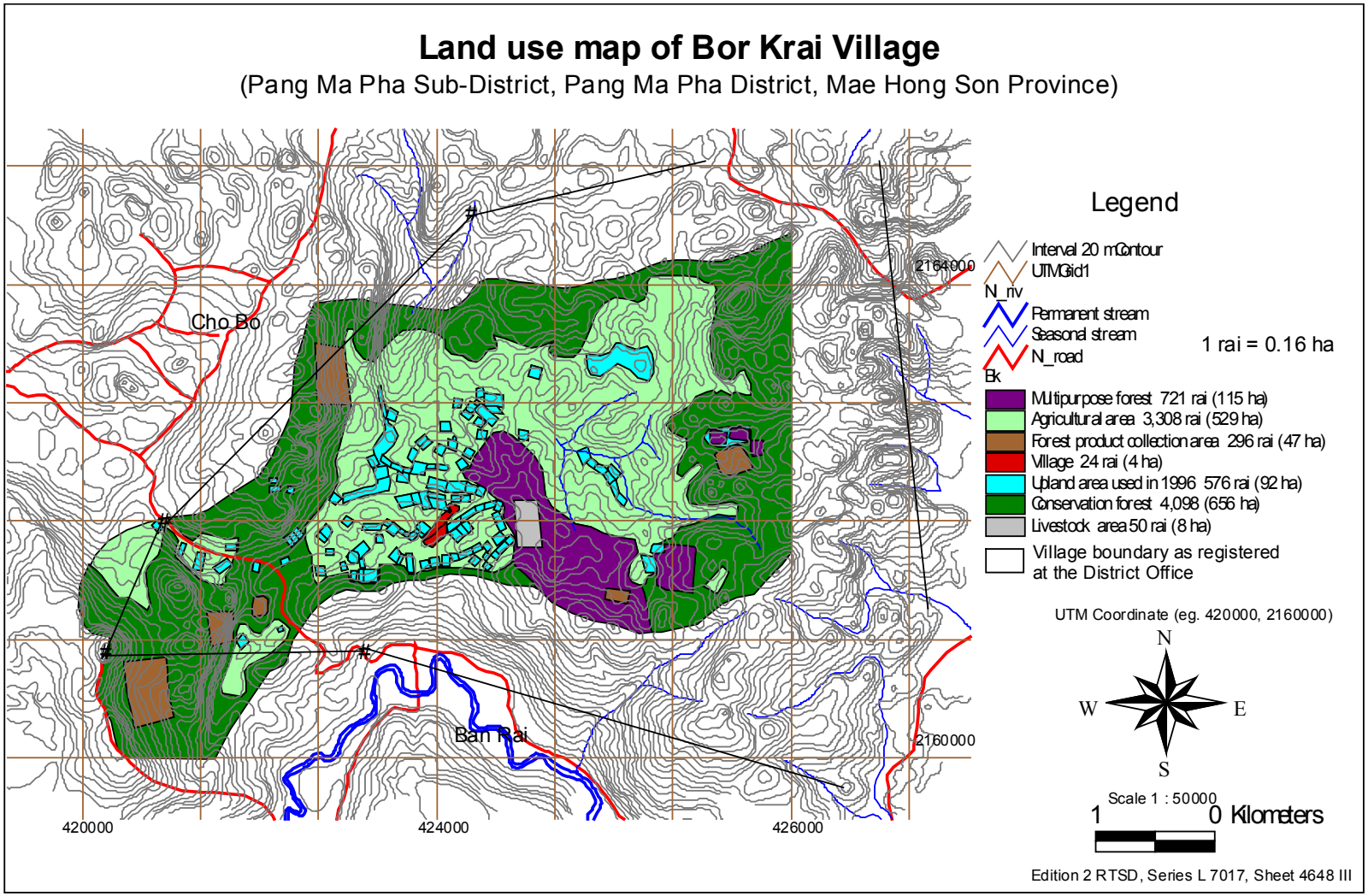


Figure 5-6: Land use map of Bor Krai village

5.1.5 A Hill Tribe Network faces government decentralisation

The neighbouring villages of Luk Kao Lam, Bor Krai and Cho Bo (all Lahu Sheleh) collect forest products like bamboo shoots, mushrooms and ornamental plants as a source of additional income. A survey revealed that each village had its own collection methods (CHUNTANAPARB et al. 1995,3). Products were harvested from similar forest areas that in some cases overlapped with other villages, and as there were no regulations, some products were collected too intensively beyond the ability of natural regeneration. From time to time villagers contacted private buyers who came with trucks to buy the entire supply. Consequently, the collection of forest products became competitive and resources started to diminish.

As a reaction to the problem, the TG-HDP staff supported a forum for the group of forest collectors, held at Luk Kao Lam village in 1996 with two resource persons from RFD (JANTAKAD and CARSON 1998,6). An outcome of this meeting was the development of a management of forest product collection. Villagers began to hold negotiations to agree on rules for collecting forest products, and the identification of forest areas in each village for forest harvesting. News that the three villages had formed a network soon spread to other villages. Their leaders expressed an interest in joining the network, thus broadening the scope of community membership to include land use conflicts, forest encroachment in watershed areas, animal raising and territorial boundaries between villages. This has worked quite well to the point that there are only little overlapping boundaries between villages and the documentation is there for all to see at the Tham Lod Tambon Administrative Organisation office of Pang Ma Pha and more recently also Tham Lod (Photo 5-5 and 5-6). Although the data has not been transferred to an aggregated land use map, this may be done should the need arise and the government recognises this approach. By 1998, more than 20 villages of all tribes had joined the Pang Ma Pha Hill Tribe Network, and membership is likely to increase.

Photos 5-5 and 5-6: Pang Ma Pha and Tham Lod Tambon land use models

The enlargement of the network required some form of organisation and gradual familiarisation with administrative matters, which was supported by the TG-HDP. A committee was set up in 1997 under the village leader of Cho Bo (Mr. Jakaisae) and monthly meetings are held in member villages on a rotational basis on issues like the land dispute between Huai Hea and Phapuak. The network expanded to include:

- Natural resource management;
- Drug addiction;
- Conservation of hill tribe cultures and traditions;
- Support for the education and accommodation of students.

Natural resource management regulations have also been drafted at Tambon level, including the more complex administration of enforcement and management (Box 5-2). One remaining mandatory difference between the Hill Tribe Network and TAOs is that the network covers member villages from all four Tambons of Pang Ma Pha district, while TAOs only operate within Tambon boundaries. At this stage data generation and updates on models and maps is rudimentary and cannot yet be carried out at Tambon level, but the membership of key agencies could create a link with high planning levels and research institutions like ICRAF in Chiang Mai for monitoring and evaluation.

Box 5-2: Tambon land use rules (from the Pang Ma Pha and Tham Lod TAO office)

Cutting trees in the watershed forest is not allowed.
The individual responsible must build firebreak protection before burning fields.
The village must grant permission prior to felling trees in multipurpose forest.
Trees cannot be cut for commercial sale to outsiders, but a Tambon member can seek permission from the village committee to sell to outsiders.
The intended area for cultivation must not be extended into the new forest.
Materials that contain poisonous substances/bombs are not allowed for fishing.
No machines or saws are allowed for tree felling, except with permission from the village committee, and permission is considered in terms of communal use.
Punishment: violators shall be arrested and fined 300 Baht for forest encroachment, and 300-500 Baht for the use of poison or bombs for fishing. The money will be deposited in the Tambon treasury and may be used for communal purposes.

The acceptance of the network by local authorities has been mixed, and interviewed members repeatedly mentioned the suspicion they faced from the district office. This has also been documented by TG-HDP staff with a reply by the district officer:

The work done is the responsibility of the government. Why is the Network trying to appropriate the duties of the government? You are just creating needless confusion. Are you trying to take over the duties of the government?" (WONGCHAN 1998,108).

When examining past policies of control and forceful integration, such a reaction is not surprising, which raises the question to what extent local agencies are willing to support informal initiatives that may not so easily be controlled, and how sustainable this initiative can be in future when faced with the danger of being declared illegal. Yet in the current policy vacuum it may not be surprising if people take their future in their own hands and this case is a good example to deal with conflicts over resource use. At the time of the Community Leaders Cross Visit Programme in May 1998 (see Chapter 3.2.4), village representatives from other areas were very interested in the network and perceived it as a chance of empowerment when negotiating with government agencies as well as an example to be followed elsewhere.

On the other hand the network had an impact on the newly forming Tambon Administrative Organisations (TAOs) in Pang Ma Pha, to the extent that the network was integrated as a sub-committee in the management of natural resources and environment. In this light the network preceded TAOs in attempts to solve pressing problems and should not be considered as competition or substitution, since village leaders that are network members are TAO members at the same time. Yet the future of the network remains unclear, since the decision making power will increasingly rest with TAOs as they are gradually set up nationwide. The proposed establishment of Technology Transfer Centres (TTC) at Tambon level will also reach remote areas in time and create a closer link between government agencies and target groups (GTZ 2001,3). It is foreseeable that conflicts over village land allocations or the provision of irrigation facilities, which previously were resolved by the network, will in future be dealt with by a TAO or attached TTC with an official mandate and funding. TAOs are still fairly new and during the field research a TTC did not exist yet. Nevertheless Pang Ma Pha formulated a first 5-year Tambon plan for 1997-2001, with proposed annual management plans from 1998 onwards. Issues included in this plan were insufficient irrigation for agriculture, water shortage, declining soil fertility, forest destruction, insufficient timber and particularly the absence of land titles affecting all 11 registered villages in Tambon Pang Ma Pha.

5.2 Tambon Huai Poo Ling

Tambon Huai Poo Ling is more uniform in terms of agricultural systems, as it is exclusively populated by about 3,500 Karen (*Sgaw*), who traditionally practised rotational shifting cultivation. At the time the TG-HDP started the Community Based Land Use Planning and Local Watershed Management (CLM) activities there in 1991, a number of problems were identified in relation to the watershed classification (see Chapter 4.1.4). Most Karen upland fields have steep slopes (30-70 %), and any land with slopes steeper than 35 % has been declared forestland. The second problem is related to the identification of intact forests for protection (ANONYMOUS 1991,3). The classification placed 80 % of the Tambon in Class 1A (Table 5-5), meaning protected forest as well as no settlement allowed. Due to the fact that they preserve their forests so well, the Landsat images that were used as a tool showed a dense forest cover for the area, so that it falls under class 1A. This is a paradox situation, in that farmers who practice a sustainable system of forest and land management are threatened with eviction, while those in areas of permanent forest removal are allowed to remain there.

Table 5-5: Watershed classification for Huai Poo Ling (ANONYMOUS 1991,5-7)

Watershed class	Government classification		Proposed revised classification	
	Area (km^2)	Proportion (%)	Area (km^2)	Proportion (%)
1A	318.6	80.2	249.3	62.7
1B	21.9	5.5	91.2	23.0
2A	35.9	9.0	26.9	6.8
2B	-	-	9.0	2.3
3	17.6	4.4	17.6	4.4
4	3.1	0.8	3.1	0.8
5	0.3	0.1	0.3	0.1
Total	397.4	100.0	397.4	100.0

A revised version was meant to give farmers more land to sustain themselves by shifting 18 % of the land under class 1A to 1B, thereby allowing agroforestry. The advantages of the proposed revision suggested:

"In protected areas the forests can really be protected, because most of them are presently not used and therefore not claimed by villagers." (ANONYMOUS 1991,7)

The CLM implementation included farmer trainings on boundaries of protected forest areas and a proposed agreement to not encroach on these areas allocated to the forest department (RFD) for control. At the time this approach was formulated, Land Use Planning Teams still existed, but now that they do not exist anymore the situation has changed back to insecurity. There has never been a written agreement with RFD on the revised watershed classification, nor on land security for farming. A survey of the Karen farming systems in Huai Poo Ling identified rice sufficiency as the main objective of villagers, as food security has become a problem (ECKERT et al. 1992). Due to poor road access, agricultural development has been restricted and was described as an extensive traditional system. Livestock rearing is the main source of cash income, while cash cropping is restricted to villages in the southern part that have reasonable road access. The general situation was described as:

"The ability of farmers to continue this system into the future is in doubt, due to increased population pressure and pressure from officials to discontinue their practice of cutting down trees. Farmers also see that their system is extremely labour intensive and are wary of having to put so much effort into cutting and clearing the forest for such low return." (ECKERT et al. 1992,25)

A number of activities to increase food self-sufficiency, livestock production and for the intensification of cash crop production were carried out under the CLM approach, initiated in Huai Poo Loei village in 1991, which expanded to 4 village groups of 12 villages total in the last phase of the TG-HDP (RATTANASORN 1998,78). Additionally, 8 topographic models covering 12 target villages were constructed, and this data was aggregated on a Tambon model. A number of other participatory extension activities of the TG-HDP included knowledge development, small-scale irrigation, the introduction of the Tambon Administrative Organisation (TAO) and the demarcation of protected forest areas. The mapping and land zonation work TG-HDP was carried out more extensively than in Pang Ma Pha, so that more villages produced land use maps. Hence Huai Poo Ling was better suited for the aggregation and digitisation of land use data.

5.2.1 Huai Hee village

Huai Hee is an old Karen village that was founded 170 years ago and is situated at about 1,000 m altitude and therefore lies in the *"Middle Zone"* (TAN-KIM-YONG 1993). The population has only increased recently, from 122 in 1991 (BACKHAUS et al. 1992,59) to now 196 (SAHLIN 2000,20), reaching a population density of 12 people/km^2. It became officially registered with the Department of Local Administration (DOLA) in 1983 as *key village* No. 8, yet was recently still considered as a class 2 village with only a potential for permanent settlement (DLD 1994). The village is bordered to the west by the Nam Tok Surin National Park established in 1981, which covers one third of the Tambon (ECKERT et al. 1992,5). In the past, Huai Hee villagers had farm land within the national park boundary, but due to pressure from the Royal Forest Department (RFD) this land had to be abandoned, a process that was monitored by the TG-HDP. Huai Hee practises mainly subsistence agriculture of the rotational swiddening type, but here too there is a transition towards permanent agriculture and fallow periods have decreased from 15 years to 8 years. Traditionally the village has five locations for upland farming, and villagers cultivate an area together. In the subsequent year some farmers move to a new location, while some stay in the old area to cultivate the remaining land that was not cultivated in the first year. This cycle then repeats itself so that in each location there is a mixture of cultivated and fallow land. Due to the surrounding steep slopes, there is no paddy cultivation and the village thus has to rely on upland rice for its staple food, interplanted with vegetables. Some livestock are reared and there are also perennial crops grown.

Although the topographic model includes an outer user boundary (Photo 5-7, white line on mountain ridge), the village map (Figure 5-7) does not. When interviewed about this discrepancy, the village committee first replied that they forgot to demarcate it, but when pressed further mentioned the controversies over the proposed agreement with the forest department on land for agroforestry use by the village, which was never implemented. The insecurity over which land villagers are allowed to cultivate persists; hence an outer user boundary does not have as much significance for farmers as it did for the village extension workers of the TG-HDP. The consequences of a village boundary remain unclear to villagers. The total village area is 1,700 ha (given by the TAO office), of which 1,151 ha are conservation forest (64 %), while 32 % of the land is used for agriculture as well as residence. There is an inconsistency in the pattern of land use in that some upland area lies outside the demarcated agricultural area, an

indication that fixed areas and mapping are not yet part of the villagers‘ perception of land use planning priorities. Of the total agricultural area of 466 ha, only 5 % on average have been used during the last three years. Fruit trees play a minor role with 7 ha under cultivation, as the fruits are only grown for home consumption due to the lack of a market and road access. With shorter fallow periods due to intensification, farmers also face a gradual decrease in rice yields.

Photo 5-7: Topographic model of Huai Hee village

In the situation of land insecurity, the main fear is land confiscation by RFD if fallow periods are too long and trees have grown too big, hence the paradox that was identified at the beginning of the TG-HDP intervention persists (ANONYMOUS 1991,3). The fear of land confiscation even grew stronger right after the closure of the TG-HDP in 1998, for now the village does not have an agency that defends its priorities anymore, and although Huai Hee does have TAO members, they expressed little confidence in negotiating the rights of the village through this government body. In spite of insecurity, Huai Hee has formulated of natural resource use rules (Box 5-3).

Box 5-3: Natural resource regulations of Huai Hee (From the village committee)

Only villagers may cut timber and can only use it in the community;
Permission to cut timber has to be sought from the village committee;
No chainsaws are permitted; Hunting in conservation forest is prohibited;
Trees cannot be cut in conservation forest or near streams;
Anyone who sees community forests on fire must extinguish them;
Agricultural areas can only be burnt if a firebreak is built and permission sought from village committee;
Fishing with explosives, electric shocks or poison is prohibited;
Fines for contravention amount to 100-500 Baht to the village committee.

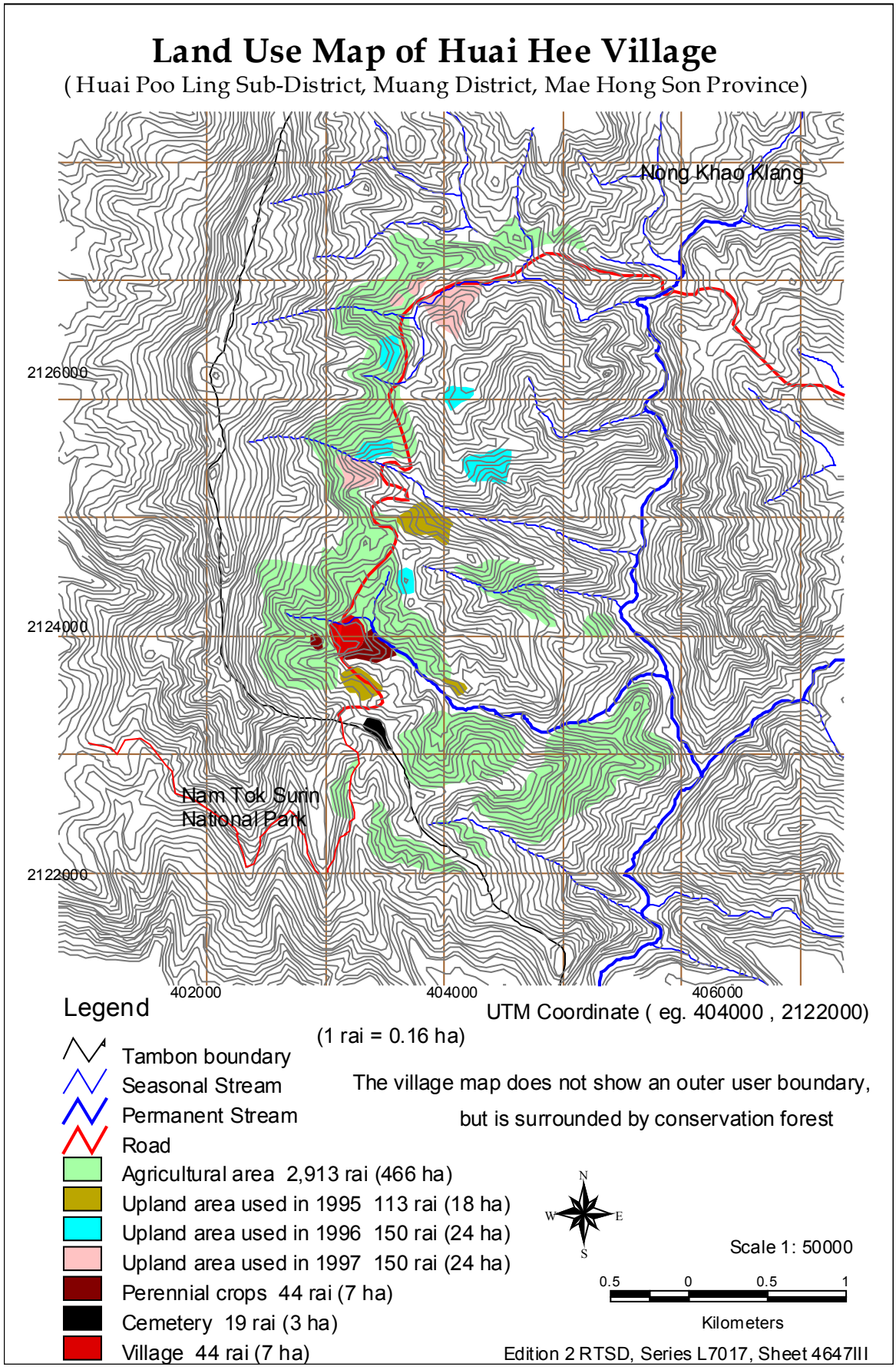


Figure 5-7: Land use map of Huai Hee village

In order to diversify incomes, the village started an ecotourism project in November 1997, supported by the Thailand Research Fund, the Thai Volunteer Service and the German Heinrich-Böll-Foundation. This development may make the farmers less dependent on agriculture for their livelihoods, and it will be interesting to see if this will bring changes in the land use patterns. The joint TÖB-funded master's thesis examined how the Karen community managed ecotourism and was perceived as a new way of natural resource management. It was perceived as a diversification from the traditional focus on agriculture and forestry to include other dimensions, with the following recommendations (RATTANASORN 1999,3):

- *"When considering sites for ecotourism the community's capacity for self-management should be considered first before assessing the physical environment. This should be developed as a network in order to maintain the ecological system and watershed.*
- *Implementation should follow a participatory path with the community to study bio-diversity, including local wisdom in conservation. This leads to a stronger identification of the community with the environment and strengthens the sense of ownership.*
- *Critical thinking should be encouraged to create a strong awareness of the village life, including negative aspects of tourism as well.*
- *Ecotourism will develop both the economy and communication skills of villagers if tourists spend more time in the village. Livelihood activities such as weaving, wickerwork, and edible forest products should be demonstrated to tourists, as well as cultural revival."*

This kind of *ecotourism* may also be perceived as *ethnic tourism* due to its focus more on Karen culture and their way of life than ecological issues of forest or wildlife conservation. It seems to lie in between both terms and thereby reflects the reality of Huai Hee life and forest farming, which is a mixture of the two. It has attracted considerable media attention as a new trend in Thailand, with questions like:

"Is it possible that one day, nobody will go to the rice fields but only dress and wait for tourists? That means their traditional way of life will be abandoned while tourists still want to see it" (THE NATION 1998).

When it comes to forest use and agriculture that is exactly what the government wants, for hill tribes are meant to abandon shifting cultivation according to government policy. This was also the reply by village leaders when confronted with this question in an interview on the impact of ecotourism (Photo 5-8).

Photo 5-8: Ecotourism planning meeting in Huai Hee village

The set-up of the ecotourism and financial arrangements after the closure of the TG-HDP has been studied in a critical report (SAHLIN 2000,22). The whole village has been involved in the project from the beginning, operating a rotation system in which each household acts as host in turn, which also applies to local guides. The tourists who stay overnight in Ban Huai Hee stay in pairs in each family's house. The price for accommodation is 100 Bath (1 Baht = 17 DM) a night per person. Of this money, 80 Baht go to the family hosting the tourists. The other 20 Baht go to the village foundation. For each meal the tourists pay 50 Baht, of which 40 Baht go to the family and 10 Baht to the village foundation. For a local guide the same system applies, namely that of the 200 Baht tourists pay a day per two persons, 160 Baht go to the local guide and 40 Baht end up in the village foundation. The village foundation is used for different activities like forest conservation and orchid replanting, equipment for hosting tourists, like blankets, mosquito nets and mattresses, as well as travelling and training of villagers in the project.

Activities for tourists include handicrafts, for which the women have a special house built with TAO support as their centre for weaving clothes, tablecloths and bags (Photo 5-9). Cotton dyeing is also displayed. Other activities include the work of the village blacksmith and plaiting. The main activity is trekking to the nearby mountain Doi Pui (1,736 m), from which one can see Mae Hong Son town, with an overnight stay in tents. With its limited agricultural potential, *ecotourism* or *ethnic tourism* could become an alternative way of planning resource use, but currently the village feels that government agencies still see them as forest destroyers.

Photo 5-9: Traditional weaving

The most important aspect of the ecotourism project seems the new communication platform with outsiders, possibly in a more appropriate way than the CLM approach. By receiving tourists, an opening of a mutual dialogue and display has begun. Ecotourism has brought training in the presentation of culture and traditions, which has given the villagers the language and skills in conveying their knowledge about natural resource conservation. There are of course open questions of marketing and control over transport as the village needs to make plans with outside agencies, but there is hope that this alternative use of land will not turn into exploitation. In future the administration of ecotourism may even be carried out by the TAO as it falls under its mandate (see Chapter 4.2.2).

5.2.2 Huai Tong village

Huai Tong (class 1, permanent village) is an old Karen village of over 100 years settlement and has grown from a population of 150 in 1964 (year of registration as *key village* No. 5) to 405 people in 1991 (BACKHAUS et al. 1992,82), to now 462 people in 112 households. The population density has thus reached 24 people/km^2. Huai Tong has also been categorised as a class 1 or permanent village (DLD 1994). Farmers still practice rotational swiddening, but due to its location in a valley, paddy fields have become established a long time ago. Paddy rice is thus the most important source of livelihood, while upland rice supplements the diet (Photo 5-10). With increasing population density, fallow cycles on swidden fields have decreased from 10-15 years to 8-12 years. Villagers own 2-5 fields ranging from 0.3-4 ha, and almost all households have paddy land in individual ownership, though no one has received any land title from the government. Upland rice harvests are decreasing from 60 tang (20 l container) per 1 tang seed to 30 tang only. With the conversion to Christianity nearly 70 years ago, old traditions like soil tasting ceremonies and dreams when selecting upland fields are fading away.

Photo 5-10: Paddy and upland fields in the dry season

The village boundary was demarcated in 1996 with the arrival of the CLM programme, but the land use model and village map are in a bad condition. Some farmers still have land in neighbouring Chiang Mai province to the east and will likely lose it once village boundaries are enforced rigorously. The mapped area does not cover the whole village, and an updating exercise was unsuccessful due to limited mapping skills (Photo 5-11 and Figure 5-8). When interviewed, village leaders responded that they do not quite understand the CLM approach, since after they displayed their land use on the topographic model it was not recognised by RFD, although that was the initial promise. Since the village has been permanent for a long time and was registered nearly 40 years ago the fear of relocation was low, but several villagers had lost swidden areas to RFD and expected that to happen again after the closure of the TG-HDP.

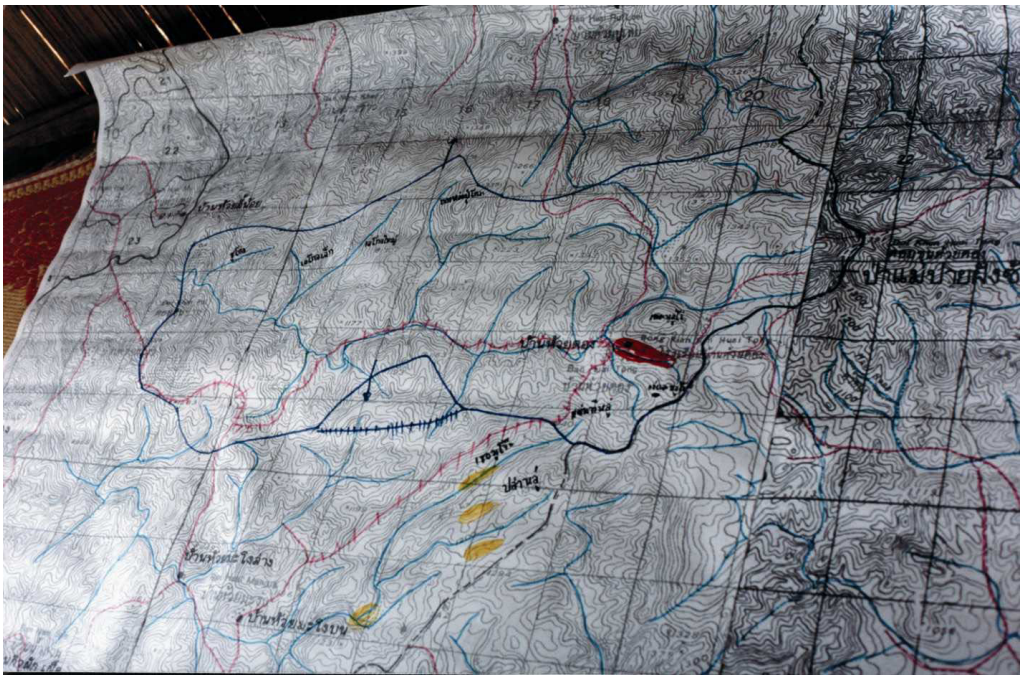


Photo 5-11: Incomplete redrawn village demarcations

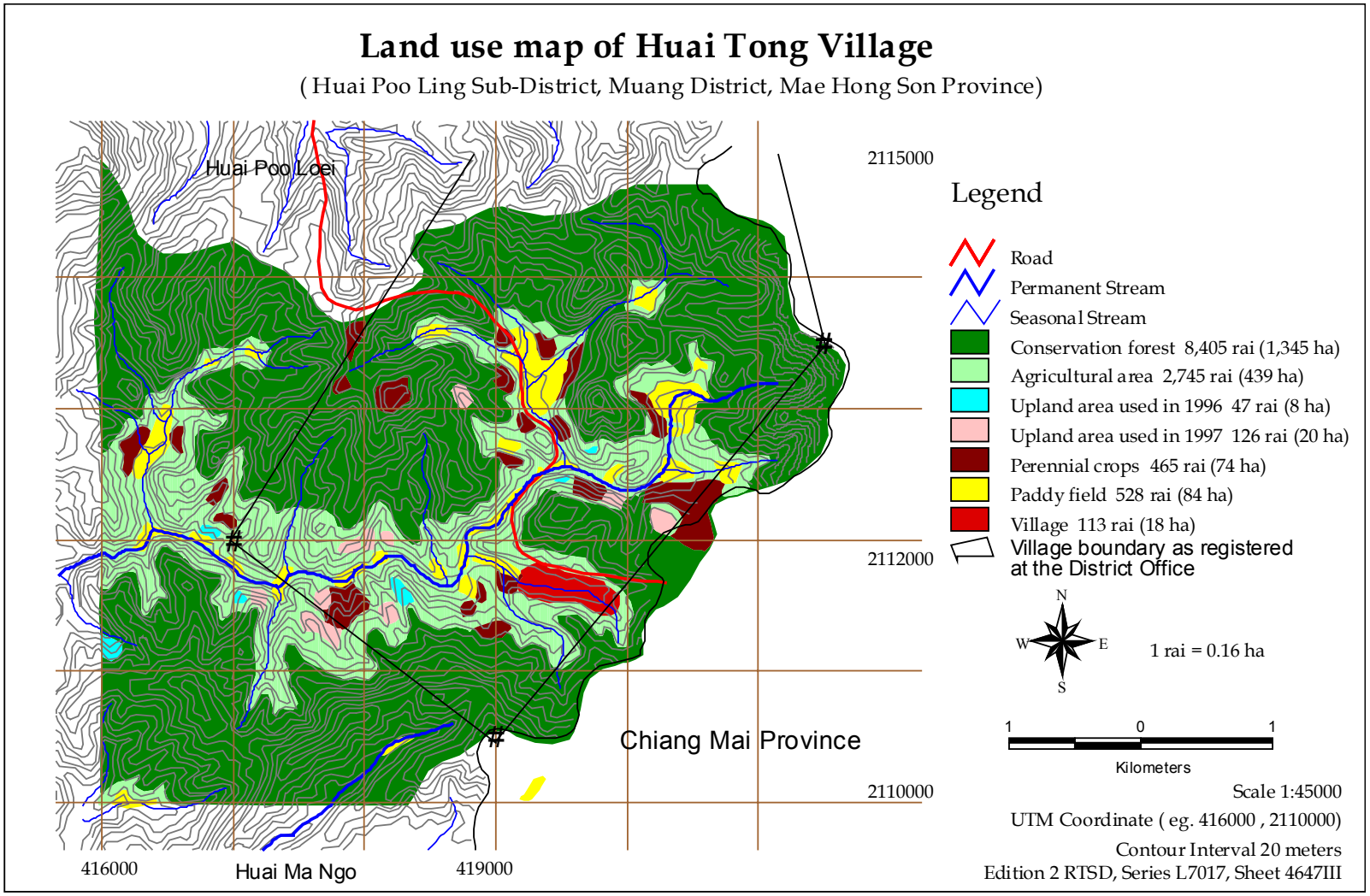


Figure 5-8: Land use map of Huai Tong village

The total village area is 1,988 ha, of which 1,345 ha or 67 % are forest, while 644 ha are used for agriculture (33 %). The village boundary will become an issue in future, since it was redrawn when its former neighbouring satellite village Huai Poo Loei was registered as a key village (DOLA 1995). Here again the villagers' own demarcation was ignored and 30 % of the land is beyond the boundary. As in the case of Huai Hea and Bor Krai in Pang Ma Pha, officials from the Department of Local Administration (DOLA) drew the boundary without consulting villagers and the modified boundary document was not given to the village. Village leaders did not yet perceive the possible consequences, though the village committee did request a copy of the DOLA documents for the registration of Huai Poo Loei. Parallel to this, RFD has started to conduct a detailed survey of plot sizes and villagers fear they may lose land with the new policy of the Mae Hong Son Governor, who only allows for 2-year fallows on uplands to reduce the total cultivation area. Additionally, only 2 upland fields are permitted and RFD has confiscated tree breast diameters of more than 10 cm in fallow areas as permanent forest areas, hence the paradox over regenerating forest applies again.

One strategy in response to the threat of losing land by villagers is to plant hedgerows between fallow areas in order to show to RFD officials that the land is being used. It seems almost absurd that farmers have to resort to such tactics to keep their land, but in this uncertain situation of an insecure *"Land Deal*" (see Chapter 1.5.1), that is the best villagers can do maintain their cultivation areas. In spite of this unresolved situation, Huai Tong has formulated village land use regulations (Box 5-4).

Box 5-4: Natural resource regulations of Huai Tong (from the village committee)

Limited wood cutting only in conservation forest, and no farming there (fine 1,000 Baht);
No chainsaw allowed for tree cutting and no logging for sale (fine 5,000 Baht);
Do not burn the forest (fine 500-1,000 Baht);
No sale of agricultural areas to outsiders;
Permission for woodcutting must be obtained from the village committee.

5.2.3 Land use map aggregation at Tambon level

Prior to the closure of the TG-HDP in September 1998, the Tambon model was completed and left with the TAO office, but without a legend (Photo 5-12). The Tambon model was still considered as something coming from the TG-HDP, which shows the lack of familiarity on the behalf of TAO members with this planning tool. Written Tambon plans had also not yet been formulated, so the potential use of digitised aggregated maps was not yet apparent. As population densities increase, it can be expected that more land will be used for permanent agriculture, but will also entail a diversification of income sources other than agriculture, like ecotourism. When aggregating maps to Tambon level, the patchiness of forest cover becomes more apparent. This patchiness is much more pronounced in Pang Ma Pha district and could serve as an indicator that Huai Poo Ling may follow the same path once the road has been completed and there is more access to infrastructure. Huai Poo Ling does not have a village network like Pang Ma Pha, so that the only forum that brings neighbouring villages together is the Tambon Administrative Organisation (TAO), which started to form in 1997 and the first representatives have been elected. Till the completion of field research in 1999, Huai Poo Ling had not yet begun to establish a Technology Transfer Centre (TTC) under the Department of Agricultural Extension (GTZ 2001,3), but the planning potential will no doubt improve once the extension programme also reaches remote areas like these. The Huai Poo Ling TAO had also not yet produced 5-year and 1-year management plans that already existed in a first version in Pang Ma Pha, an indication for gradual access to remote areas. Villagers need time to get used with planning formalities and administration, as it is totally new to them, so that even though the information was much more readily available, its relevance and significance has yet to be fully understood.

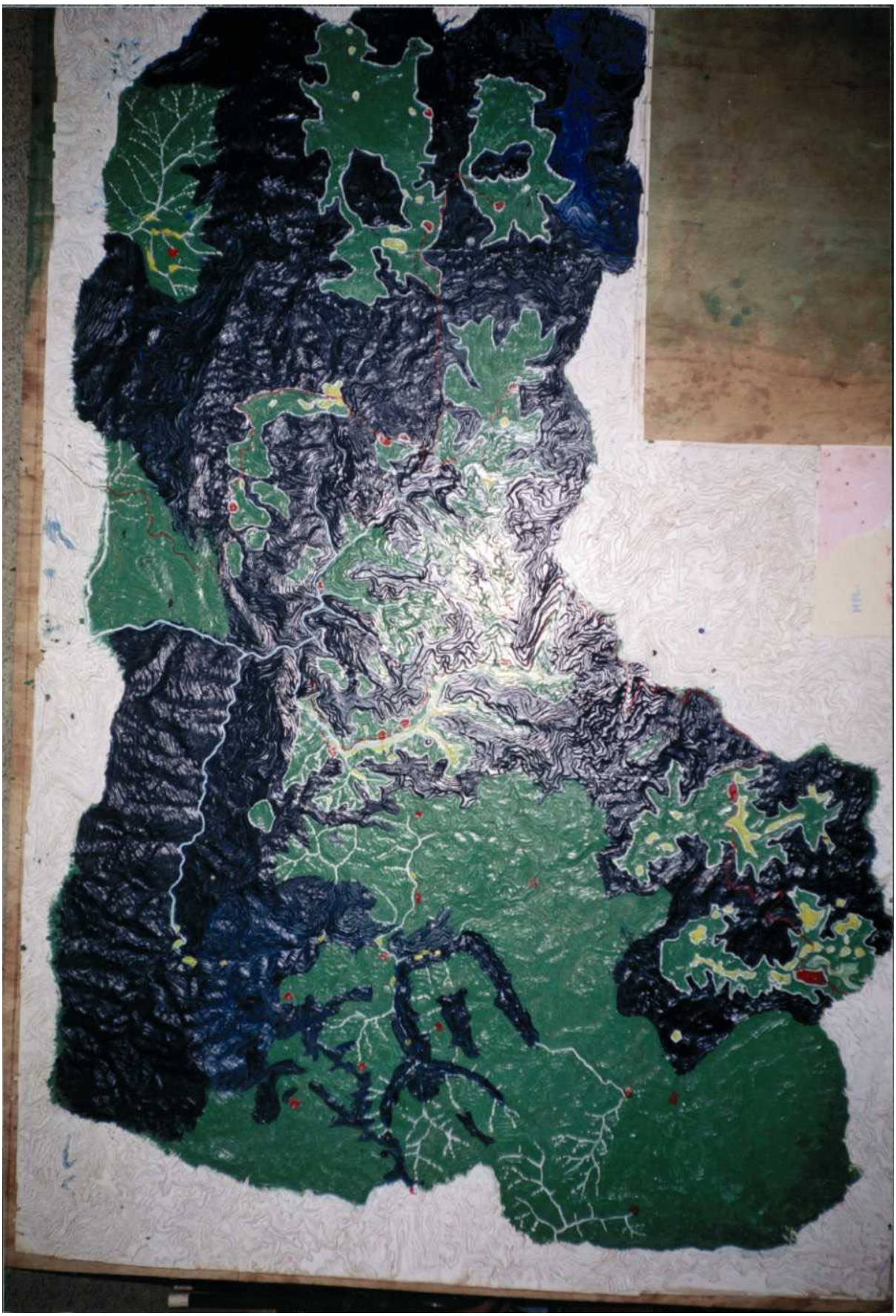


Photo 5-12: Tambon model of Huai Poo Ling

Village maps can be deceiving when land use data is examined at the aggregated level. Figures of digitised maps were compared to those of the TAO office based on manual calculations and show quite a few differences (Table 5-6). The greatest difference is the area demarcated as conservation forest, with 76.5 % forest as compared to the measured proportion of 61.8 %. Possibly the TAO office has considered all the areas outside the TG-HDP project area as forest, in spite of the fact that there are villages. According to the TAO data, only 23 % of Huai Poo Ling is agricultural area, while the measured proportion was 33 %, based on the fact that only 23,800 ha have been digitised. Figures in brackets refer to the total agricultural area, of which 6,200 ha are demarcated as upland area (78 %) and show the large extent of shifting cultivation still practised.

Table 5-6: Comparison of land use demarcations at Tambon level (data from the TAO office and digitised village maps)

Land use type	TAO data (ha)	Ratio (%)	Digitisation (ha)	Ratio (%)
1. Conservation forest	28,433	76.5	14,700	61.8
Ordained forest	not mapped		1,000	4.2
2. Total agricultural area:	8,569	23.1	7,900	33.2
(of which used in 1995)	(190)	(2.2)	(100)	(1.3)
(of which used in 1996)	(202)	(2.4)	(300)	(3.8)
(of which used in 1997)	(201)	(2.3)	(700)	(8.9)
2.1. Perennial crops	(106)	(1.2)	(300)	(3.8)
2.2. Paddy fields	(184)	(2.1)	(300)	(3.8)
3. Villages	150	0.8	200	0.8
Total Tambon area	37,152	100.0	Mapped area: 23,800 ha	

The digitised village maps were aggregated on a sub-district map, and the white areas indicate villages that lie outside the TG-HDP project area (Figure 5-9). It is peculiar that the village of Pa Kaa lies outside the Tambon boundary (in neighbouring Pai district in fact), if the data provided by ONCB Survey Department are correct. To date there exist no reliable maps from the Royal Survey Department indicating exact Tambon boundaries, though with on-going decentralisation more emphasis will be placed on mapping. If one considers that the demarcation of boundaries is a relatively recent phenomenon in Thailand and reveals European influence, then this situation is not surprising (WINICHAKUL 1998). But even more important is the fact that there are overlapping areas claimed by adjacent villages (marked in pink), which may lead to conflicting claims over its use, particularly since the Department of Local Administration (DOLA) draws even other boundaries when registering villages. In most cases this land lies in conservation forest areas, which means that the total forest area claimed by each village is actually less when aggregated to Tambon level.

The total upland area of 6,200 ha makes up some 17 % of the whole Tambon area, or with perennial crops paddy fields and land used in the last three years amounts to 7,900 ha or 21 % of the Tambon. According to own calculations the area cultivated each year has increased from 100 ha (1.3 %) in 1995 to 700 ha or 8.9 % of the total agricultural area in 1997, a rather sharp increase that needs to be monitored. The total mapped forest area amounts to 14,700 ha or 40 % of the Tambon, but as only 23,800 ha or two-thirds of the Tambon have actually been mapped, the fact that of the mapped area 62 % is conservation forest is more significant. This figure comes close to the proposed modified watershed classification value of 62.7 % for the Tambon (ANONYMOUS 1991,7), but as the proposal by the TG-HDP was never officially accepted by the forest department, it is difficult to judge these demarcations in terms of targets. These figures may change if at some stage the entire Tambon will be mapped, but for the time being there is no organisation that will continue that work, so it will remain a trial example.

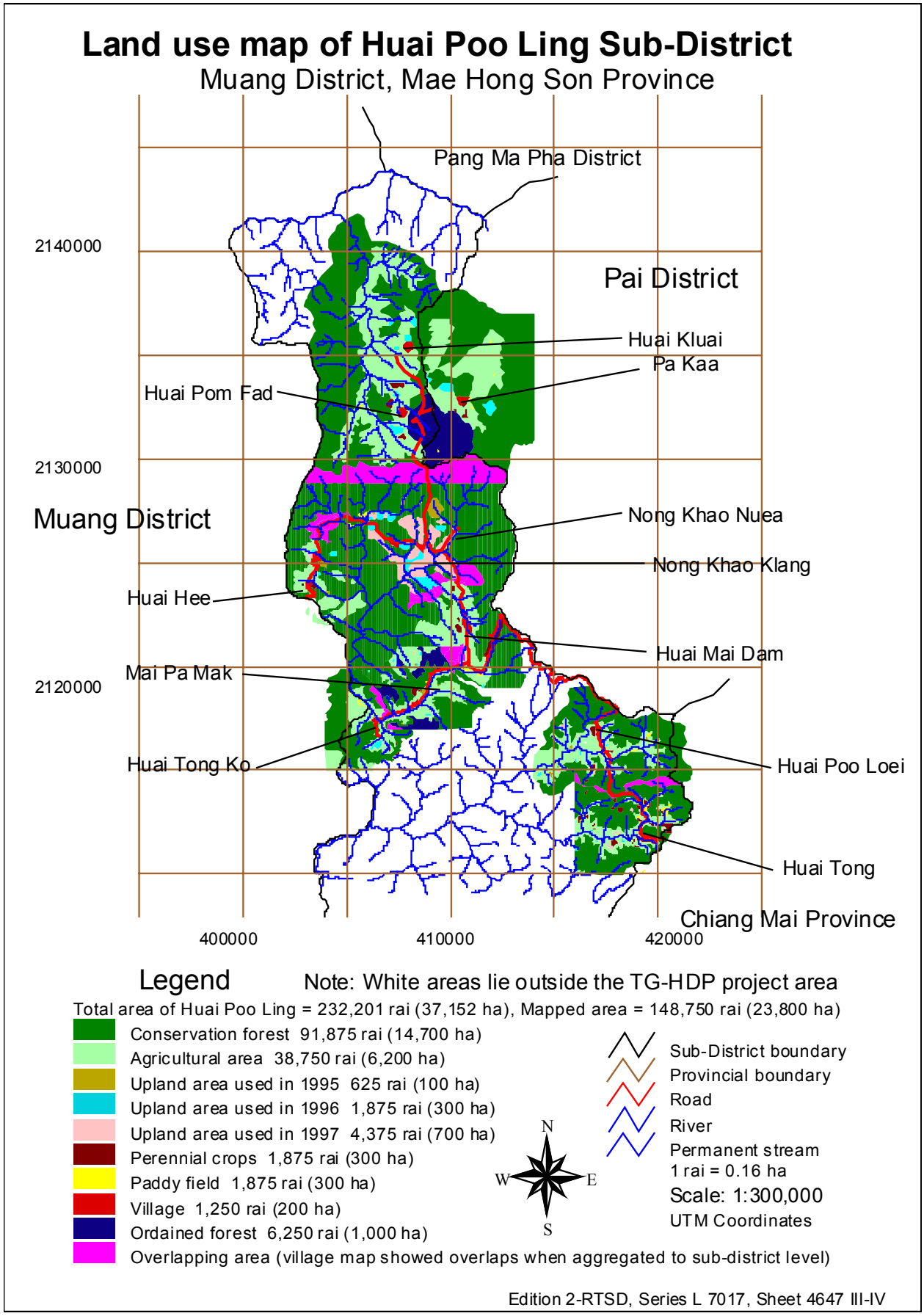


Figure 5-9: Land use map of Tambon Huai Poo Ling

Extrapolated to national level the area under conservation forest by far exceeds the target of 25 % protected forests set by RFD. Yet without specified individual target figures at provincial, district or local level it is difficult to judge whether forest conservation efforts are successful. The method of aggregation of digitised land use maps at village level is to be seen as a possible new approach to land use monitoring, in spite of the inherent imperfections and inaccuracies. Aggregated data has a relatively high level of inaccuracy, but until the most important priority for government agencies, namely the relation between conservation forest and upland area, does not change, the range of application of this method remains limited. At least for Huai Poo Ling the method has shown that the forest cover remains high with the Karen rotational shifting cultivation system, while only a small area is burned and cultivated every year. Even though these inaccuracies are prevalent, it is possible to aggregate hand drawn village maps through digitisation and this method may become more recognised as planning is likely to become more coordinated.

The choice of six different villages, each with specific characteristics with regards to the agricultural system, the proximity to a national park or wildlife conservation area, the effects of the CLM approach, the government classification in terms of permanence, the village registration status and the clarification of boundaries has yielded a wide range of problems and local ways to circumvent or resolve them. What the diversity has also shown is that there are still so many controversial factors influencing land and settlement insecurity, that it is too early to apply a standard approach of data digitisation at village and aggregation at Tambon level for planning. Not only has there been an over ambitious and too short project intervention by the TG-HDP, compared to a *Project Model* (VAN DAM 2000,13). More importantly is the fact that the communal planning approach was conducted without a legal framework to back it up and hence unresolved issues of forest control, upland agriculture and land security remain so. The *hybrid research approach* (FORSYTH 1998,113) that linked local situations with the policy environment enabled an exposure of the diversity of issues, while at the same time aggregating the available data at Tambon level for Huai Poo Ling. The use of an experimental GIS Beta version in combination with participatory appraisal techniques was sufficient to display the range of problems and to identify stumbling blocks to a functional communication platform for joint planning. In this case the installation of a fully functional GIS, which has its own technical and logistical challenges (ELLER 1996,52) was not necessary, particularly since there was no project to continue the work. In this sense the research rather led to a problem identification instead of a problem resolution, yet as planning is a political process, it is important to first determine the problems before they can be overcome.

6 Evaluation of the planning approach and outlook

"For a future-oriented and sustainable land management the question of land tenure and legal presence is of prime importance. The trust that has been built up over a long period will eventually be destroyed again if the threat of relocation remains."
(LIMCHOOWONG and OBERHAUSER 1995,22)

The above statement reiterates the persistent fear that underlies highland development after decades of research and development projects, and as it gets to the stage of political implementation from within, it is perhaps only natural that most bilateral programmes have withdrawn. If one goes back to the two key conditions the FAO has defined for planning to be useful, then the first one of changes in land use being accepted by the people involved has been fulfilled (FAO 1993,1), as hill tribes are in transition towards permanent agriculture and government agencies make efforts to coordinated planning. For the hill tribe farmers this meant a total change in livelihood practices, agriculture and more recently the integration into the Thai administration. The participatory CLM process initiated by the TG-HDP has influenced as well as supported the target villages to move away from shifting cultivation towards permanent agriculture. However, judging from most discussions and problem elaborations, the whole process is still perceived as a forceful change imposed on hill tribes, rather than a joint planning effort supported by government agencies. In this situation of uncertainty, farmers have developed a number of strategies to overcome land security problems, and these strategies will be used as an entry point in the analysis of the proposed planning model, tools employed for surveys and the impact of continuously changing government policy.

6.1 Resilient problems and hill tribe strategies

"CLM implementation has been accepted at the provincial policy level. As a result, relocation programmes have been stopped. Government officers now agree that humans can live in harmony with the forest, accept the value of indigenous knowledge and the capability of community organisations with regard to NRM issues." (ANONYMOUS 1998,vol.1,44)

The final statement of the TG-HDP on natural resource management implies that the second key condition for land use planning has also been achieved, but if one examines the local situation in more detail, the impact of the political situation becomes clearer. A number of problems or conflicts have been revealed through the combination of participatory mapping and interviews, which indicate that the CLM approach has still not been accepted at provincial policy level and questions the future of land use planning. The diversity of survey areas has enabled the identification of a broad range of problems, so that the focus on mapping for planning purposes has perhaps not solved problems, instead it revealed and exposed them.

The most common problem was rice insufficiency or a decrease in upland rice yields as fallow periods gradually decrease. The problem is most severe in Pa Charoen, which was the smallest village and had the highest population density of 160 people/km^2. In other villages the decrease in rice yields ranges from a reduction of the former seed/yield ratio of 1:60 down to 1:30 or even 1:15, hence villagers have to find alternatives to meet their rice needs. The only villages where the rice demand can be met with paddy rice are Huai Hea and Huai Tong, as other villages either have no paddy land (Pa Charoen and Huai Hee) or are not allowed to grow paddy due to the protected forest status (Luk Kao Lam, Bor Krai). The decrease in rice yields is the result of population increase and the government's insistence on shorter fallow periods with the threat of land confiscation on long fallow areas, as mentioned by villagers from Huai Tong, Bor Krai and Huai Hee. Alternatives to upland rice include fruit trees like in Pa Charoen and Huai Tong, intensified livestock like in Bor Krai and ecotourism like Huai Hee and Bor Krai village, with the aim to raise cash for the purchase of additional rice. While in Pang Ma Pha only Bor Krai had started on a small scale with guided tours of the nearby fish cave, Huai Hee has embarked on a comprehensive programme. This issue attracted quite some attention at the community leader cross-visit programme at the end of May 1998 prior to the TG-HDP workshop, particularly when Lahu leaders saw the set-up in Huai Hee.

Environmental awareness and appreciation for the cultural heritage of hill tribes, including aspects of ecotourism for income diversification, are encouraged by the NGO Inter Mountain People Education and Culture in Thailand (IMPECT) for the Karen, based in Chiang Mai (TRAKARNSUPHAKORN 1997).

The second most common problem relates to the management of forest and fallow areas, as all villages with upland areas mentioned conflicts with the Royal Forest Department (RFD) like land confiscation. The fear of confiscation was most clearly displayed in the RFD surveys in Luk Kao Lam, Bor Krai, Huai Hee and Huai Tong, which exposed the villagers' strategy of declaring more land under cultivation than actually used, sometimes up to double the amount, in order to keep enough for subsistence. A further farmer strategy to keep swidden fields is to interplant hedgerows at regular intervals in fallow areas, particularly employed by the Karen, so that forest officials perceive this land as cultivated. This conflict was already described ten years ago as a paradox punishment for forest preservation (ANONYMOUS 1991,3), and the fact that it still occurs is an indication for the lack of a common understanding and appreciation of the Karen fallow systems. In addition, after the closure of the TG-HDP in September 1998, upland farming was seriously threatened by the new Governor of Mae Hong Son province, who only allowed two-year fallow periods on uplands and only two upland fields per household. Farmers overstepping this limit have been arrested, fined and areas in excess confiscated. Additionally, RFD has the permission to confiscate fallow land with trees that have a breast diameter of more than 10 cm to declare it permanent forest.

The third main problem complex refers to boundaries of demarcated fields within villages as well as with neighbouring villages, for there was a lot of confusion over outer user boundaries and to what extent they are recognised by government authorities. Some villagers even expressed the fear of the whole village being forcefully relocated, particularly in Luk Kao Lam, but most of them felt that a boundary is a concept imposed by outsiders, with little relevance within a village and no recognition by the government. The confusion was increased when village committees saw the boundaries that the Department of Local Administration (DOLA) set at the time of village registration in combination with the classification by the Department of Land Development (DLD) in terms of potential for permanence. This brought to light the lack of an official structured method for demarcation and zonation. Related to this is the lack of confidence and ability to update topographic models and village maps, for besides the fact that villagers feel insecure, they question the usefulness of updating without a clear purpose for planning. At policy level, the cabinet resolution of 30 June 1998, which cancelled the positive step taken a year before in favour of limited forest settlement, increased the feeling of insecurity. This raises the issue of whether models and maps will not backfire and be used to confiscate swidden fields instead of building on the achievements of the past.

If one compares the above problem complexes, which either have always persisted or have been revealed during the research, to the principles of participatory land use planning (Chapter 2.4.3 and GTZ 1995,8), then these principles seem more like an ideal guideline instead of reality. Approaches like an orientation to local cultural conditions, a cooperation of all stakeholders, transparency and free access to information have not been possible or were not politically wanted, which made it so difficult to develop a research method that takes care of all these factors. On the positive side, a number of these issues were more broadly exposed through the research. With regards to some of the underlying issues of land security and communal forest management, a brief overview to what extent land zonation and demarcation are compatible with traditional forms of land tenure and forest perceptions illustrates some difficulties.

6.2 Land classification and forest types

As highland development projects started to apply various land use planning approaches that included varying extents of local participation, this meant a fundamental change for hill tribes with their traditional forms of land tenure and communal forest management. From the beginning the Thai language was used in all extension campaigns, so hill tribes not only had to become familiar with the northern Thai terminology for types of land, but also had to change their traditional perceptions to match the new language that was used for all official demarcations. All the topographic models and village maps use the Thai terminology, and categories either had to adapt to this classification or disappear.

6.2.1 Land tenure terminology

The traditional land tenure systems show a great variety in categorisation and individual ownership, whereby there is a marked contrast between established shifting cultivation systems of the northern Thai, Karen as well as Lua, and the more recent pioneer systems of the Lisu, Lahu and Hmong. The pioneer systems traditionally did not have a notion of individual land ownership; instead the more powerful traditional leaders used the land easiest to farm, while other farmers had to manage with more remote areas. The whole situation was of a very temporary nature, since not only were fields always abandoned in the search for new ones, but the whole village also migrated. There is very little information on historical individual land ownership, a situation that only changed recently with the establishment of permanent villages and permanent paddy fields that quickly became the most valued land. Therefore the concept is a very recent one for pioneer swiddeners, and in Pang Ma Pha it was introduced by the TG-HDP extension campaigns. This explains why villagers started to mark individual upland fields on topographic models and village maps when they joined the CLM approach, as the early campaigns were coupled with hopes for land titles. When these did not materialise, the disappointment was considerable and villagers soon also stopped the production of village land use maps, as they were felt to be of little use. As land use information began to be aggregated at Tambon level, individual fields were also left out in favour of land zonation, even for the most valued paddy land in Huai Hea village for example.

The situation is quite different for rotational swiddeners like the Karen, and none of the village maps in Huai Poo Ling showed individual upland fields. Historically, the Karen believed in a mountain spirit who is the protector of the land, and a religious leader called *"Zikho"* had the authority to allocate land that belonged to the community to individual households (GANJANAPAN 2000,159). Land in private ownership includes paddy land as the most valued land, orchards and house gardens. As the Karen were progressively integrated into Thai society, the authority of land allocation was transferred to the village headman. The notion of common land still persists and includes swidden land, animal grazing grounds, watershed areas and forest areas for hunting and gathering of forest products. The Karen even have a sophisticated terminology for swidden land (called "*ker*") depending on the length of fallow, ranging from 1-2 fallow years to 3-4 fallow years, then 5-6 fallow years and for more than 7 fallow years (ITTHIPONOLAN 1998,9). However, for official planning purposes only the cultivation year is marked on maps, and all swidden fields are labelled *"thi rai"*, a term that traditionally designated field crops in northern Thailand. Other Thai land categories include paddy land *("thi na"*), gardens and fruit trees, *("thi suan"*), and grazing areas (*"thi liang sat"*). The area inside the outer user boundary is called village area (*"khet muban"*) and in Thai implies the entire extent of the village, including all agricultural areas. The fact that villagers may have land beyond these boundaries is rejected for official planning purposes and this land does not exist anymore. This is the terminology that is used on all models, maps and documents.

6.2.2 Forest types

The situation for forest types and their categorisation is more complex, as the Karen have a highly sophisticated terminology for forest types based on location, proximity to water and type of water source, hilltop forests and holy grounds (NA AYUTHAYA 1997, 124; ITTHIPONOLAN 1998,23). The Lahu distinguish a smaller diversity of forest types, yet these also differ from the Thai terminology (S. GANJANAPAN 1997,248). The diversity of forest categories is not reflected in the official Thai terminology, which has a term for conservation forest in general *("pa anurak"*) and one for forest reserves *("pa raksa"*). A term that creates some confusion is the northern Thai term for watershed forest (*"pa ton nam"*), for it is not included in the official RFD terminology (S. GANJANAPAN 1997,254). Land use maps of Huai Hea and Luk Kao Lam demarcate watershed forest as a separate area apart from conservation forest, yet villagers are unclear about this distinction, as it does not correspond to their traditional classification and hence a clear boundary between these forest types is alien to the villagers' perception. In contrast, Karen villages demarcate all this area as conservation forest. The term for communal woodland or multipurpose forest (*"pa chai soi"*) is clearly understood by all villages, as it corresponds more to their own notion of forest areas for wood and other product extraction. There remains one difference regarding hunting, which traditionally was allowed in this forest, yet is officially forbidden by the government, particularly in the villages of Luk Kao Lam and Bor Krai within the wildlife sanctuary boundaries.

One category of forest emerged from the Buddhist approach to development of the 1970s and is often described as a traditional classification (GANJANAPAN 2000, 6), namely the sacred forest (*"pa buat"*). Hill tribes in the survey areas were all Christians with remnants of animistic traditions, and their terminology recognises more than one type of sacred forest, so that the Buddhist term that is widely used for enforcement of community rights is still relatively new to them. Buddhist monks perform a tree consecration ceremony in a community forest by wrapping yellow robes around the tree trunks, which is meant to reconstruct a village's right as the protector of the forest in the negotiation with the state for the recognition of community forestry. Such a ceremony was performed in Huai Poo Ling in early 1998 and an area of 1,000 ha has been demarcated on the Tambon map of Huai Poo Ling, yet on the Tambon model this type of forest had the same colour as the surrounding conservation forest. TAO members saw this demarcation as a chance to have their land classifications recognised by the government during the public readings of the Community Forestry Act and meetings of the Northern Farmers Network, and used copies of the Tambon map in poster size for their campaign and repeated demonstrations in Bangkok. This shows the resourcefulness and willingness to use all means available to hill tribe farmers in their struggle for a land deal. To what extent this forest category will eventually be recognised officially remains speculation. Land categorisation has thus become a mixture of traditional perceptions and Thai extension activities, resulting in classifications that do not match the prevalent watershed classes identified by the forest department RFD. Until there is a clear legislation and respective extension campaigns to clarify the terminology, confusion over parallel classifications will prevail.

6.3 Topographic models and GIS application

The usefulness of results is based on the data quality as well as on the nature of projects or organisations that might apply them. The research project changed from a technical approach with the use of remote sensing, satellite imagery and GIS to a more descriptive one based on a very particular policy framework in Southeast Asia that still renders participatory land use planning in the highlands illegal, even after 20 years of development programmes. This also affected the data quality and work methods, for detailed satellite imagery and aerial photographs were refused by the Royal Survey Department (RSD) on security grounds of border areas. Some old photographs on a scale of 1:50,000 were eventually made available, but as the International Centre for Research in Agroforestry (ICRAF) in Chiang Mai confirmed, a higher resolution is required for work at village and Tambon level. The same applies to GIS, for there was no GIS programme, nor a database for Mae Hong Son at the TG-HDP. It was later only possible to work with a trial version from Chulalongkorn University, which was handed over to ICRAF upon leaving Thailand.

One may question whether a development project should work with those means on its own and to what extent a small research project should introduce such complex and expensive technology, a matter debated for land use planning in Asia (ELLER 1996,52). On the other hand, the employment of even a simplified Beta version of GIS enabled the documentation of local land use classification at village and Tambon level, as well as the overlay of boundaries drawn by DOLA upon village registration, an approach that to date is new in Thailand. Thereby the contradictory policy framework was illustrated graphically, yet this controversy could have been displayed even better had RFD made the restrictive watershed classification available for inclusion. The combination of three-dimensional information in the form of models with digitised two-dimensional maps is assessed in terms of the extent they are indeed complimentary (RAMBALDI and CALLOSA-TARR 2000,20), or whether the participatory aspect remains an apparent "*Oxymoron"* (ABBOT et al. 1998,27). The combined approach brought to light unresolved issues that focus on who can update land use maps, to what extent this is indeed a participatory process, the danger of misuse in terms of land confiscation for reforestation, and necessary policy changes so that these tools can be used in a constructive manner. With regards to up-scaling, it is useful to differentiate between village and Tambon level, particularly as the institutional dimensions of coordinated planning mainly rest with the Tambon as the lowest level of government representation.

6.3.1 Village level

The issue of local concerns has been achieved to the extent that each village as a whole agreed on the area demarcations, which for planning purposes is a step forward from rough sketching without

geographic references. This also applies to boundaries with neighbouring villages, with the exception of the western boundary of Huai Hea. As with fields outside the boundary, villagers have resigned to the fact that these will eventually be lost, although this is a considerable sacrifice for them. As for the compliance with government priorities, villagers have displayed the willingness to set aside a large part as conservation forest in line with government reforestation interests. Villages also fulfil criteria as permanent settlements with elected village leaders. When conducting land use planning, the most common form of data display is still land use mapping, though the use of three-dimensional topographic models is more transparent to villagers than two-dimensional maps. However, villagers with more mapping skills favoured the more detailed maps in poster format over Tambon models with crude land categories. This insight only came as data was transferred to Tambon models and overlapping areas or the omission of paddy fields due to small sizes was noticed. Although Pang Ma Pha had only a few village maps, TAO representatives from Huai Hea and Bor Krai compared their maps with what was drawn on the Tambon model and raised the question of future updates as well as responsible agencies.

The inclusion of the boundary drawn by DOLA at village registration attracted a lot of attention, as none of the villagers had received documents with the demarcations. So having those included on the drawing confirmed their fear of losing land and made them wonder why the TG-HDP or any other agency had not considered this issue. In future it must be assumed that government agencies will only recognise DOLA boundaries, not those of the villagers, unless there is a chance for these to be redrawn. If this should become possible, then the results described in this thesis can be used as a starting point to illustrate incoherence. Linked to boundaries is the fact the population will continue to grow and new villages will be formed, so the process of taking land from the old village to allocate it to the new village has to be formalised. Village boundaries may cause tension as in the case of Huai Hea with new village Phapuak or it may happen in mutual agreement as in the case of Bor Krai and its former village of origin Cho Bo. This calls for a standard procedure that is transparent to affected villagers and mutually recognised, an approach that to date does not exist and thus leaves room for manipulation and favours based on relations with the district office.

The major shortcomings are based on the lack of a clear policy for highland development. The Royal Forest Department (RFD) refuses to recognise the land demarcations and continues to confiscate land, and the Department of Local Administration (DOLA) does not use village demarcations when registering villages, thus questioning the trust farmers placed in them as they participated in the CLM approach of the TG-HDP. The early breakdown of the Land Use Planning Teams (ANONYMOUS 1998,vol.1,33) indicates that planning in agreement with government representatives never really worked, as the policy dichotomy between forest protection and permanent agriculture was never resolved, and there is as yet no coordinated highland planning. This also refers to the two key conditions FAO states for planning to be useful, namely the need for changes being accepted by all stakeholders and, even more important, the political will to put plans into effect (FAO 1993,1). As long as whatever plans, be they in text or map form, can be overturned, there is no basis for a stable planning platform. Unclear land rights continue to be a *"killer assumption"* (BETKE 1994,137) in the hill tribes' struggle for a land deal, and the on-going long-term land titling project continues to leave out the sensitive highlands in the absence of a policy framework (RATTANABIRABONGSE et al. 1998,10).

Shortcomings also apply to the access of hill tribes to decision-making power and public knowledge, as the ownership of data has shifted in favour of outside agencies. Mapping revealed the extent and type of land use, which has led to land confiscation by RFD and the provincial Governor. This situation defeats the purpose of participatory planning, particularly since it is not backed up by a policy framework other than the restrictive watershed classification of 1983. There is no justification for land confiscation, with the exception of breaching demarcated conservation forest areas, but since RFD can reverse any demarcation, there is only a limited basis for hill tribes that would encourage long-term planning jointly with the government.

The issue of updating digitised maps is completely out of the control of villagers, as seen in all villages, and requires an interest and cooperative approach by planning agencies for regular consultation. For villagers, even updating models is difficult, as shown in the case of the *satellite* village Pa Charoen (Pang Ma Pha), which was left with an incomplete model after the closure of the TG-HDP. On a technical scale

the research was conducted with a Beta version of the Arc View GIS programme, meaning a trial version for evaluation prior to its official release, and there are errors in the programme that would need to be corrected should it really be used one day. If a system is set up properly it can also include data on marketing, yields, soil series and erosion indexes for map combinations. Here there is an important potential role for the development of a monitoring & evaluation system with a nationally accessible database as proposed in the current national plan (NESDB 1997,148), but would only be meaningful under a mutually agreed development plan for the highlands.

6.3.2 Tambon level

The same local concerns apply at Tambon level with questions of whether it would not be better to stick to topographic models only. Here local concerns show a clear priority for outer village boundaries as in the example of Bor Krai, which is more difficult to display on a small printout of a Tambon map, but can be done on poster size. One reason why it is so important for villagers to demarcate outer user boundaries at Tambon level is related to the hope of recognised land rights or titles, which in the early days of CLM had been expressed individually (ANONYMOUS 1998,vol.1,46). Now that these villages are registered and village leaders are members of the Tambon Administrative Organisations (TAO), they reiterate their hope to obtain land rights at communal level. The idea is not entirely new to Thailand when looking back at the concept of *Forest Villages* initiated in 1975, where settlements were established in forests and land was allocated to families with certified occupancy rights, while government agencies were to develop amenities (HAFNER and APICHATVULLOP 1990,337). This programme was designed for Thais only and hill tribes were excluded, but as nearly 90 % of hill tribes in the TG-HDP areas have gained Thai citizenship, they would qualify for the same rights should the approach be discussed anew, even in modified form.

Under the current process of decentralisation, the TAO act was a big step forward to include registered hill tribe villages in the Thai administration, and the second Master Plan for Highland Development supports that. Particularly the aggregation of land use demarcations gives a better picture of the whole situation than at village level, including aspects of access to water for irrigation, the size and location of common forest areas like the ordained forest in Huai Poo Ling, and also the forest fragmentation as new villages are registered and demarcate their agricultural areas. However, as long as the Royal Forest Department (RFD) and the Department of Land Development (DLD) are not represented at TAOs and in the District Hill Tribe Committee, joint planning with a common goal is not possible. It is very difficult to obtain the commitment from farmers for planning if two key agencies are absent in the decision-making bodies. The absence of these key agencies at Tambon and district level are inconsistent with the aims of the 8th NESDP that calls for participation of local communities, and this once again reveals the highly political nature of forest management (GANJANAPAN 1998,73). Hopefully the next Master Plan due for 2002 can set a framework for the inclusion of all relevant agencies at district level with respective mandates and defined roles in the administration of the highlands.

One potential to deal with these differing priorities at Tambon level could evolve from the current restructuring project of the Ministry of Agriculture and Cooperatives (MOAC) as part of the ongoing process of decentralisation. A part of this reform at grass-roots level has been the introduction of Technology Transfer Centres (TTC) initiated in 1998 with 82 TTCs established nationwide by the Department of Agricultural Extension (DOAE), with the aim to cover all Tambons in the next few years (GTZ 2001,14). Tambon Huai Poo Ling and Pang Ma Pha will eventually also be included in this approach that began with more central areas. There are plans to link new TTCs with TAOs, of which all registered villages are members of, and TAOs will become the major future channel for the transmission of funds and resources, though the details of responsibilities are still developed. In the past DOAE was absent from all natural resource management activities in the highlands, a situation that is incomprehensible, but it seems that this institutional gap will finally be addressed. As laudable as this intervention may be, it remains to be seen to what extent it can really be implemented, for the documents related to the restructuring of the ministry do not define clear mandates for agencies. The mere membership of key implementing agencies does not solve practical problems of application and mandate definition, therefore the political will for implementation has to be demonstrated. One need only recall the failure of the Thai Forestry Sector Master Plan (RFD 1993), which was formulated with similar foreign support but was never implemented. This may serve as a warning that new policy directions do not necessarily lead to their enactment in the

form of a law. For the time being, topographic models are more suitable for planning at Tambon level and easier to update, but should TTCs be properly equipped in future and highland policies harmonised, digitised maps will gain importance for the relative ease of updating information.

6.4 Government agencies in communal planning

Given the uncertainty of highland policies, some government agencies have nevertheless attempted to deal with sectoral issues on a limited scale. DLD has produced an extension book on land capability in Mae Hong Son (DLD 1994). It focuses on nine areas surveyed for the resolution of controversial land use as a priority for lower lying areas, though funds are lacking to cover the whole province. In response to the Cabinet Resolutions of April 1997 regarding land settlement in forest areas, there has even been an attempt by the RFD provincial office in Chiang Mai to solve land use conflicts (RFD 1997), but the preface still shows the priorities when it states that 70 % of the land is in "*perfect condition*", meaning under forest cover. The proposal only refers to degraded conservation forest in lower lying areas and excludes the issue of land titles. Some RFD staff in Mae Hong Son is in favour of the CLM approach and joint planning with hill tribes, and this even extends to the Community Forestry Division in Bangkok (LIMCHOOWONG, personal communication), but unless the laws and mandates are changed, individual officers will not go against official policy. The recent revocation on 30 June 1998 of the April 1997 resolutions granting limited settlement in forest areas shows the continuous lack of a unified policy for highland development and should serve as a warning on the fragility of participatory land use planning efforts in the highlands.

There are a number of institutional implications from this study, yet with the particular situation that the process of institutionalisation of participatory land use planning occurs largely without the influence of bilateral development projects, as most of them have been terminated. At the same time, the current restructuring of the Ministry of Agriculture and Cooperatives, with an Asian Development Bank (ADB) grant (GTZ 2001), could be used as an opportunity to rectify policy contradictions such as a needed revision of the restrictive watershed classification using proposed alternatives that also consider the needs of local people (KNIE and MÖLLER 1999,146). Some experiences of GIS application at village level and when aggregating data at Tambon level could be used for this approach, such as degazetting (or removal from the RFD authority) areas for agricultural use. Another controversial topic is land titles, which were uncommon in Thailand in the past (CHALAMWONG and FEDER 1988, 132), but due to overall improved infrastructure even hill tribes have become aware of the on-going Thailand Land Titling Project (RATTANABIRABONGSE et al. 1998) and hope to be included in that programme. In terms of national plans, the Second Highland Master Plan as well as the Eighth National Economic and Social Development Plan both expire this year, so that the above issues could be addressed in new plans.

In this context the Tambon could evolve as the true interface between the government and society, both in terms of a technical perspective with new Technology Transfer Centres (TTC), as well as an administrative one with existing Tambon Administrative Organisations (TAOs). The proposed plans to link TTCs with TAOs (GTZ 2001,15) need to consider the importance of representation of key agencies like forestry (RFD) and land development (DLD) for aspects of land management in TAOs, as well as local administration (DOLA) and social welfare (DPW) for the registration of villages with clear and agreed boundaries. The mandate for TTCs could rest with the extension department (DOAE) in the development of information and the provision of training to familiarise village leaders with the planning structures of the government. Even more important is recognition of hill tribe land demarcations, which ideally would be carried out in agreement with DLD and RFD. This idea goes back to the land use planning teams initially proposed by the TG-HDP and there is a risk of failure, but there is a difference as to whether such teams are imposed from a foreign project or whether a similar set-up is developed by the local stakeholders themselves. In this sense the seeds for development were sown in the past and may emerge in modified form within local organisations. Additional support will come from the Pang Ma Pha Hill Tribe Network that goes beyond the administrative government delimitations. Or looking at it in another way, the ongoing process of democratisation makes it more and more difficult for the government not to address participatory resource management.

6.5 A proposed approach

In line with the repeated claim for participation in a bottom-up land use planning approach, it is proposed that the process starts at village level. In this sense one should not speak of a start, since Pang Ma Pha and Huai Poo Ling have benefited from many years of TG-HDP intervention that have shaped and modified land use systems. In the absence of yet to be established Technology Transfer Centres (TTC), it is possible to build upon past experiences and develop a system that can be integrated into the new government extension approach at the time it reaches these remote areas. A bottom-up approach would need to focus on the three main problem areas identified during the research, namely rice sufficiency, forest fallow management, and village boundaries.

Rice sufficiency or in a larger sense food sufficiency in rice-based farming systems is a problem that villagers cannot solve on their own, particularly since they are undergoing an externally pushed fundamental change of their cultivation methods. Here the prime responsibility for governmental support lies with two agencies; the Department of Land Development (DLD) in the promotion, subsidisation and monitoring of soil and water conservation technologies, as well as the Department of Agricultural Extension (DOAE) in the supply of information and external inputs like improved varieties, fertilizer and livestock vaccination schemes. Particularly with rice it is important to also consider hill tribes preferences for traditional upland rice varieties that are more adapted to the highland environment and have a particular taste, though they require more land, yield less per area and take more time to mature (v. KEER et al. 1998,116). The Highland Rice Research Station in Pang Ma Pha is the suitable institution to carry out such research and develop improvements (RERKASEM and RERKASEM 1994,92).

The issue of forest management and fallow regeneration goes back to the restrictive and outdated watershed classification as well as the government's perception that agriculture may only be carried out on permanent plots, to the point of categorical rejection of fallow systems. Fortunately the situation has changed in favour of improved fallow systems as Alternatives to Slash and Burn (ASB) activities by ICRAF (SURASWADI et al. 2000), but with to date no official recognition from the forest department. It is time for a modified watershed classification that goes beyond a fixation on forest cover and reforestation with monocultures from which the primary stakeholders cannot benefit. Reforestation of degraded areas can be carried out with the inclusion of local people in order to consider preferences for certain tree species and other forest products as identified by the Pang Ma Pha Hill Tribe Network, and also to enable a controlled forest utilisation as set out in village land use regulations. Ideally, village representatives would be employed by the Royal Forest Department (RFD) as forest guardians for those areas in the immediate vicinity of the village, thereby drawing on the notion of ownership of natural resources in combination with responsibility and liability for their maintenance. To date RFD has been reluctant to employ hill tribe farmers for the fear of relinquishing control (LIMCHOOWONG, personal communication), but the necessity to include local people gains importance. The increasing pressure for the recognition of community rights (GANJANAPAN 2000,5) that accompanies the debate over a Community Forestry Act (CFA), further supported by the new constitution of 1997, enhances this development.

The third complex of village boundaries may at first seem to only have administrative implications linked to Thai citizenship and village registration (AGUETTANT 1996). Yet when villagers lose cultivation areas to newly registered villages as in the case of Huai Hea and Bor Krai, or when the Department of Local Administration (DOLA) identifies outer boundaries that cut off agricultural areas, then this affects land use planning directly, for farmers cannot count on this land to meet their livelihood needs. The consequences of upland confiscation by RFD are of the same nature, leading to farmer strategies of excessive land claims to secure the necessary minimum. This problem was particularly acute in cases where villagers demarcated farmland under the CLM approach and documented that on village models and maps, yet were faced with the reversal or annulment of these classifications once the TG-HDP had closed down. These injustices call for a clear and transparent system of land demarcation and village boundary identification, so as to establish a mutual trust in a procedure that is accepted by all stakeholders, with generally applicable terms of reference. As population densities increase and new villages are established, such an approach will inevitable require giving up land, but it should occur within an approved framework.

In recognition of the stepwise process established by FAO (1993,11), a similar approach should be employed under the specific circumstances of the highlands, to be conducted by TAO members in cooperation with RFD, DLD, DOLA and DPW:

1. **Designation of district government officials as TAO members**; previously none of the above agencies were TAO members, so it is important to secure their commitment to land use decisions. District officials would be members of all TAOs in their mandate, which in the case of Pang Ma Pha would be four Tambons. This is a solution for limited financial means, for it is unlikely that government staff can be hired additionally at Tambon level.
2. **Display of existing village land use models and maps**; the available information and land classifications need to be assembled and assessed for possible omissions or mistakes (even lack of data for Pa Charoen village). This data will serve as a basis for aggregation at Tambon level, with uniformly identified land categories to avoid confusion over terms like protected and reserved forest.
3. **Problem analysis by all stakeholders**; at this stage the problems and priorities by all stakeholders need to be formulated and explained, so that all members are aware of them from specific perspectives such as rice sufficiency or watershed protection.
4. **Identification of land use opportunities**; this is a very difficult stage that inevitably leads to power conflicts over issues like forest mandates between RFD and village leaders as well as the location of permanent farming in relation to DLD classifications. Though this process is supported by the current debate on community forestry, this stage may the end of planning if the absence of a legal framework for highland development persists.
5. **Evaluation of land suitability;** here there is a risk of reverting to the previous classifications based on physical properties only. Alternatives exist in principle (KNIE and MÖLLER 1999), but their applications have to be tested.
6. **Governance over land types;** the mandate and responsibility over land types needs to be determined and accepted by all TAO members as well as government representatives, otherwise conflicts like centralised control and exploitation of a common ground for which no one is clearly responsible will continue as stumbling blocks to planning.
7. **Signing of land use agreements**; it is very important to obtain written consent for land use agreements, backed up by maps models with demarcations understandable by all parties, as there needs to be a form of commitment to decisions. A written agreement may predate the long desire for land titles, and should include options for communal resource management in line with hill tribe perceptions.

The procurement of data and updates at village as well as Tambon level can of course not be carried out by government representatives at Tambon level for lack of technical and logistical infrastructure. Yet the membership of key agencies at this level could be a starting link with higher planning levels such as ICRAF or the GTZ assisted Sustainable Management of Resources in the Lower Mekong Basin Project (SMRP) in Chiang Mai (ANONYMOUS 1999), which have the means to generate land use maps and plans for the Royal Forest Department as their counterpart agency. That was part of the strategy of the Sam Muen Highland Development Project (LIMCHOOWONG and OBERHAUSER 1995,18), though after the project closure in 1994 all computer equipment and many staff were transferred to Bangkok. A more sustainable approach has been taken by the non-governmental organisation CARE with the long-term project in Mae Chaem district of Chiang Mai, which has worked in cooperation with ICRAF in this manner for digitised land use maps (ANONYMOUS 1997). CARE has even expanded this approach to other project areas recently (SRIMONGKONTIP 2000), in combination with written land use agreements signed by all parties in the watershed committees. This is still of an informal nature and is the only known case in Thailand that has reached so far in the process, so it should serve as an encouragement that the above approach may not be completely unrealistic, even under current contradicting policies. This positive example may not be so easily replicable in other circumstances, for it is subject to favourable local conditions, but is a model to be followed.

One may extrapolate and imagine what Pang Ma Pha and Huai Poo Ling might look like in 20 years, with increasing population density, better infrastructure, tarmac roads, more tourism and sophisticated means to monitor opium production so as to make cultivation in the highlands nearly impossible. The first marked change is most likely going to be a drastic reduction of forest cover, replaced by permanent agriculture and more ethnic tourism attractions. As new villages continue to emerge and require land for agricultural production, forests will gradually disappear, as is already the case for most of Tambon Tham Lod. But is this not a realistic development when looking at the global state of forests? There remains of course a desire to maintain and protect remaining forests, not only for ethics, but also for the sheer necessity of forest areas and water supplies for survival. It is doubtful if the aim of forest protection should be pursued in areas of concentrations of people, or whether it would not be more important to define a number areas with little or no settlements for flora and fauna protection, without the disturbance of annual fires in the dry season and human interference in form of different types of tourism. If one aims to secure biodiversity, then the mere number of national parks is not significant, but their size and location including water availability, and areas free from major threats to wildlife like national highways and golf courses as found in the Khao Yai national park. The Royal Forest Department still stands for the guardian of the nation's forests, but in Mae Hong Son province it has lost a lot of credibility since the logging scandal of the Salween forest was exposed (KAOPATUMTIP 1998), where forest officials benefited from logging.

If one pursues such thoughts further it begins to dawn that it is unrealistic to maintain the status of the Pai Wildlife Sanctuary for the villages of Luk Kao Lam and Bor Krai in Pang Ma Pha, as well as the Nam Tok Surin National Park in Huai Poo Ling, for it is only a matter of time for the road to become a tarmac road and more human interference. It may be more realistic to maintain communal woodlots in these areas, for they are not suited to maintain significant numbers of wildlife populations. The above considerations do not come light-heartedly in the face of serious environmental problems in Thailand, but are intended to illustrate that clinging on to restrictive forest mandates does not serve either purpose of forest protection, nor of a sustainable land use planning approach. Perhaps a communal approach may turn out much less threatening if highland development embraces a truly participatory planning process.

Photo 6-1: Which future for land use planning in the highlands?

7 Conclusions

The timing of this research project towards the end of the longest development project in northern Thailand is controversial, depending on the perspective for assessment. In terms of development, it was important to witness and document the changes beyond project duration, such as the Cabinet resolution of June 1998 revoking forest settlement rights and more locally, the confiscation of land by RFD officials, and the arrest of hill tribe farmers cultivating more than two upland areas by the Governor's office in Mae Hong Son. A petition by Tambon leaders to the Parliament in Bangkok for the recognition of their livelihoods as part of the Assembly of the Poor demonstrations, supported by Thai versions of digitised land use maps to show forest conservation efforts, failed to assuage the difficult and highly political situation. From the viewpoint of the TG-HDP, which expired before results were available, the research project should have been conducted three years earlier in order to integrate results into project work. Yet had the research been completed earlier, the impact of policy inconsistencies would not have been so clearly noticed and some aspects even completely overlooked. The breakdown of a seemingly established participatory land use planning approach like CLM also led to a reorientation towards the political situation and the realisation of the absence of a legal framework for planning. Given these conditions the question arises whether land use planning is a suitable tool to address the complex problem situation in the highlands.

The clearest conclusion that can be drawn from the research is that land use planning needs a political foundation upon which a participatory process can be built. Without such a foundation it is very difficult to carry out a participatory process, for top-down policies will overrule any proposed alternatives to land use, thus not reaching a point of a jointly agreed land use plan for implementation. In the examined cases, differing priorities could not be unified and compromises were difficult to reach, taking the form of tolerance by government agencies as long as a foreign funded project existed. Agricultural zonation was carried out based largely on village demarcations, yet without agreement from the Department of Land Development and the Royal Forest Department. Hence land use maps at village and Tambon level were only of limited use, as the land demarcations were not recognised by authorities. As long as this state of land insecurity persists, hill tribes will resort to strategies to keep enough land for agricultural production, like the declaration of up to twice the number of upland fields under cultivation, and the interplanting of hedgerows in fallow areas to indicate that the land is used. Such a situation is what led to the term of a struggle for a *"Land Deal"* in the constant fear of land confiscation. Linked to this is the absence of government extension services to provide advice to villagers on improved crop management and the supply of seeds as well as fertiliser to raise mainly rice yields. From the point of view of the Karen and Lahu, this left them in a situation where extension support was provided as long as the TG-HDP operated in the area, and once the project closed, they not only had to resort to land securing strategies, but were also left alone in the management of new crops as well as soil and water conservation.

The relevance of land use maps and their digitised form can be questioned as well. Placing a village on a map has the advantage that it exists for outsiders, thereby creating a reality that is difficult to remove subsequently. Not only is the village placed on a map, but its land demarcation is also displayed and can be monitored, showing an effort to comply with the government's aim to ensure the existence of forest in every village. This leads to the issue of a fixation with forest cover to stay within the limits of what the government has declared, yet without further considerations around the management of a forest area and possible specific purposes. The incorporation of land use data into a GIS remains a largely extractive process in this context, but may also serve to show that hill tribes make an effort to plan their resource use. Yet the potential of a GIS goes far beyond land demarcation, as it extends to data on land capability, slope, crop requirements, soil quality and water availability. In the context of hill tribe villages that are only gradually integrated into Thai society, such factors could not be included for the present thesis. For the previously autonomous hill tribes, the whole idea of mapping and planning with outside agencies was new and requires time to get used to. The digitised maps produced during the field work will probably have little relevance for the target villages in the current planning process, as there are to date no agencies that will continue to work with this approach and update land demarcations, just like topographic models are unlikely to be updated. Yet the factor that was very relevant to villagers was the inclusion of boundaries by the Department of Local Administration (DOLA) at the time of village registration, for it exposed discrepancies graphically and created more transparency.

Under the given circumstances, the research may seem to have been premature or not appropriate for the capacity of local agencies, for issues like land use map production and updating remain open for reasons of a lack of capacity and relevance under the current inhibiting policy situation. While this is true to a certain extent, it exposed some flaws and inconsistencies in the planning system and pointed to the agencies that would need to modify their approaches to rectify the situation. This means that tools for illustration and display of present as well as potential land use are not readily available to accompany written land use plans, should they be formulated. The current state of 1-year and 5-year plans at Tambon level cannot yet be described as land use plans, for they have the form of a list of requests for improvements like road construction, irrigation and public facilities, with proposed budget requirements. However, the recent restructuring of the Ministry of Agriculture, of which the proposed establishment of Technology Transfer Centres (TTC) at Tambon level are a part of, may provide an opportunity to expand the request lists to actual land use plans accompanied by respective maps for intervention areas. A lot depends on whether the past supply-driven attitude of line agencies can really change towards demand-driven approaches. When embracing a participatory approach, the institutional level that best creates a link between the state and society in Thailand is the Tambon or sub-district. Hence it will be at the Tambon that the viability of land use planning will be decided.

By first committing agencies to become a part of the Tambon Administrative Organisation (TAO), the key government actors would have to be brought to the negotiating table, an exercise that previously had failed. If the political will then extends to participatory planning, the achievements of the CLM approach may be recalled and digitised land use maps employed for planning at village and Tambon level. This is not an element of wishful thinking, but instead should be seen as a potential to address the situation, and the software as well as land use maps are accessible at the ICRAF office including the ArcView programme if it is required for further activities. The simple application of GIS in the context of this thesis could later be incorporated into extensive databases that could even extend to decision support systems should they be developed. This is still speculation and as yet far from reality, and policies first have to clearly define goals and implementation steps for a highland master plan that extends beyond village registration with boundaries, permanent settlement and Thai nationality to include natural resource management with emerging changes in mandate and governance. For the time being such a unified approach does not exist yet, but a stage of debate and expression of community rights has been reached in northern Thailand, including those of minority hill tribes, that the process of institutionalisation will continue as the country follows a path to democracy.

Overall it seems that the research has raised more questions instead of answering them, but perhaps this is what good research results in. The impact of framework conditions led to a redefinition of the proposed planning model, as it became very difficult to apply a universally defined land use planning approach of FAO, and the surveys were accompanied by questions like the direction natural resource management would take and for whom results would be useful. In this context the combination of a research project with a development programme was very positive in that it enlarged the scope of research to include political and practical realities of implementation. The breakdown of a defined approach with land use planning teams by the TG-HDP raised more doubts about the viability of a participatory approach. This is also the reason why the proposed approach was formulated carefully and should not be seen as a blueprint of how to go about it, for there are many more factors playing a role, including those that have nothing to do with land use planning, like the future and viability of Tambon Administrative Organisations themselves. Now that most highland development projects with foreign support have withdrawn from Thailand, the future of planning approaches will be shaped by local formal and informal institutions. The participation of hill tribes in this process will increasingly occur within the public debate of community rights over forest resources and the power struggle over the required Community Forestry Act. As hill tribes are more and more integrated into Thai society, their previously specific livelihood problems will merge into problems of resource scarcity and land security also faced by Thai marginalized farmers. The resolution of problems and sustainable land use planning will turn into a testing ground for the application of good governance at the local level.

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Annexes

Annex I: Important events

Date	Where	Activities
14-18.10.96 18-22.11.96	DSE, Bad Honnef DITSL, Witzenhausen	Seminar on Participatory Development Work in Rural Areas, and GIS-Workshop
11-16.3.97	MHS and Nam Lang (NL)	TG-HDP meeting to review CLM
20.3.97	ICRAF Office (CMU)	Meeting with David Thomas on cooperation and integration of village maps into a GIS
3-4.4.97	Chiang Mai University (CMU)	Workshop with Hohenheim and Kasetsart University on Special Research Project (SRP)
28.4-2.5.97	Bangkok	Trip to DLD, RFD, IBSRAM, RECOFTC
25-28.5.97	MHS	Phasing out workshop with RIAs and RFD training on participatory working approaches (PWA), visit to RFD office data application
4-5.7.97	Chiang Mai University and Nam Lang	Meeting with Hohenheim and Kasetsart University on the new Special Research Project
2.9.97	CMU	ICRAF follow-up workshop on "Indigenous Strategies for Intensification of Shifting Cultivation in Southeast Asia" at CMU
18.9.97	Nam Lang and Huai Poo Ling	ONCB helicopter flight, aerial photographs of villages
11-13.9.97	NL, Luk Khao Lam, Huai Hea	NRM network meeting in Huai Hea on land conflict with Pa Puak, collection of village maps for digitisation
6-10.10.97	Chiang Mai University (CMU)	Hohenheim, Kasetsart and CMU seminar on joint MSc projects
17.10.97	TG-HDP	Seminar on integration of village maps into GIS with 15 people and Dr. Saengsawan from Chulalongkorn University, ArcView3 given
28-30.11.97	MHS, Huai Hee	Ecotourism trip and hiking with Tawatchai Ratanasorn and GO/NGO group
11-12.12.97	Hohenheim University	Tropentag, Poster Presentation
6.2.98	Chiang Mai University	Seminar on the new Special Research Project
2-6.3.98	Huai Thong, HPL, Huai Hee, MHS, NL, Huai Hea, Luk Khao Lam, Bor Khrai	Trip with Prof. Dr. Uwe Nagel to villages to study CLM situation, discussion of future research and structure
11-12.3.98	MHS	Provincial centre for DOLA village boundaries
28.4.-4.5.98	Bangkok	Meetings at DLD, RFD and Royal Survey Department (RSD) for aerial photographs
25-29.5.98	Doi Inthanon, Mae Chaem, Yang San, NL, Bor Khrai, Tung Jaw	Community Leaders Cross-Visit Programme of TG-HDP prior to final NRM international workshop, discussions of problem situation

1-5.6.98	Empress Hotel Chiang Mai	TG-HDP workshop on NRM experiences in highlands, presentation of own first results
8-11.6.98	Bangkok	Collection of aerial photographs at RSD
26.11.98	ICRAF office Chiang Mai	Handing over of ArcView 3 software and digitised maps
1-3.7.98	Rincome Hotel Chiang Mai	GTZ Regional Working Group meeting
25-26.8.98	Mae Hong Son	TG-HDP farewell ceremony with the Governor
4.9.98	Empress Hotel Chiang Mai	TG-HDP closing ceremony
29.10.98	Chiang Mai University	Introductory seminar for Hohenheim students
26.11.98	ICRAF office Chiang Mai	Handing over of ArcView 3 software and digitised maps
18.12.98	Mae Lanna	ONCB helicopter flight, opium survey
26.1.99	CMU	MSc thesis defence of Tawatchai Ratanasorn on hill tribes and ecotourism
27-29.1.99	Rincome Hotel Chiang Mai	CARE workshop on "Sustainable agriculture and survival of watershed forests"
18-22.2.99	CMU, all 6 target villages	Final workshop for presentation of results, with 2 MSc students, and village field trip to discuss results with village leaders in project areas
9.3.99	Alliance Française, Informal Northern Thai Group	Presentation on: "Does participatory Land Use Planning have a chance with hill tribes?"
23-28.5.99	Purdue University (USA)	Paper presentation at 10th ISCO Conference
14-15.10.99	Humboldt University Berlin	Tropentag, paper presentation
11-12.10.00	University of Hohenheim	Tropentag, paper presentation

Annex II: Questionnaire for village surveys

1. Name: _____ Date:
2. Does the household have Thai citizenship?
   Yes ( ) no ( )
3. When did this household move to this village? _____ years ago
4. How long has the household cultivated own fields here? _____ years
5. How many people live in your household? _____
6. How many wet rice fields (tii na) do you have and how much did you harvest?
   1 ( ) size: _____ rai; harvest: _____tang
   2 ( ) size: _____ rai; harvest: _____tang
   3 ( ) size: _____ rai; harvest: _____tang
   4 ( ) size: _____ rai; harvest: _____tang
   5 ( ) size: _____ rai; harvest: _____tang
7. Do all the fields lie within the village boundary?
   If not, in which village do they lie?
8. Which second crop do you grow in wet rice fields?

	1	2	3	4	5	6	
							harvest: _____tang
garlic	_	_	_	_	_	_	harvest: _____tang
onions	_	_	_	_	_	_	harvest: _____tang
_____	_	_	_	_	_	_	harvest: _____tang
_____	_	_	_	_	_	_	harvest: _____tang
_____	_	_	_	_	_	_	harvest: _____tang

9. How many upland (tii rai) fields have you cultivated this year?
   Number sizes:_____
10. Are these fields all within the village boundary?
    If not, which village do they lie in?
11. Do you own these fields? ( ) yes ( ) no
    any land title? (channot)
12. How many years do you cultivate these fields?
    1. _____years
    2. _____years
    3. _____years
    4. _____years
13. How do you select your upland fields each year?

( ) soil colour; ( ) soil taste; ( ) tree size; ( ) religious beliefs ( ) dreams, explain; ( ) others:

14. Do you need permission from the village committee to choose upland fields?
    If yes, how do you obtain it?
15. After cultivating upland, do you always look for new fields or do you come back to same ones after some years (moonwien)?

16. If you come back to same ones (moonwien), how long is the fallow period?

field	1	2	3	4	5
1 year	_	_	_	_	_
2 years	_	_	_	_	_
3 years	_	_	_	_	_
more than 3 years	_	_	_	_	_

17. Has the fallow period changed in upland fields over 10 years?

( ) increased ( ) decreased
if decreased, why?_____

18. Do you cultivate fruits? ( ) yes ( ) no
if yes, is the area on the village model?
19. If cultivating fruits, are these your own fields or communal village fields?
( ) own ( ) village
20. Do you grow fruits for consumption or sale? Fruits: list
21. Do you keep all your livestock in the livestock area on the model or also outside the village boundaries?

22. Which products do you collect in the multipurpose forest?
23. Which are the most important crops for consumption and which for sale?
(1 = most important, 5 = least important)

	consumption:	sale:
rice	_____	_____
maize	_____	_____
garlic	_____	_____
onions	_____	_____
beans	_____	_____
others	_____	_____

24. Can you grow enough rice for the household?
( ) yes (..) no
25. If not, what would you like to do to grow more rice?
Irrigate: Have more area: Use fields outside village: Other:
26. Which other crops would you like to grow more of and where?
On rice field: on upland field: crop
27. Which products do you collect from conservation forest (paa anurak/paa ton nam)? Are cattle allowed to graze there too?
( ) yes ( ) no
28. Have you participated in the construction of the village land use model?
( ) yes ( ) no
29. If not, who marked your fields on the village model?
30. Do you use the model sometimes to select your upland (tii rai) fields?
( ) yes ( ) no
31. Do you use it when selecting any other fields for planting rice or fruits?
( ) yes ( ) no
32. Can you decide on your own each year where to grow crops or does the village committee have to agree?
( ) own decision ( ) village committee has to agree
33. Why does your village have a model?
34. Has anything changed for you since you have the model?
( ) yes ( ) no
if yes, what: more rice cultivation area? less rice cultivation area?
more upland area? less upland area? lost land outside village boundary?
less choice where to grow? More service from government extension service?
35. How often do government officers look at your fields?
( ) never ( ) one time ( ) every year
36. Does the model cover all the areas you cultivate?
( ) yes ( ) no
if not, which ones are left out?
37. Do you think the model is useful? ( ) yes ( ) no
38. Who do you think uses the model?
39. If you have problems with other farmers about fields, how do you solve them?

40. Do you think the Amphoe office accepts your way of using land?
( ) yes ( ) no
41. If not, how do you think it could be accepted?
Joint meeting: Signing of land use plan; Issued land title (channot):
42. Do you have conflicts with RFD because you live in wildlife sanctuary?
( ) yes, which ones? ( ) no
43. Do you have enough land to support your household? ( ) yes ( ) no
if not, what else can you do to live?

Annex III: Questionnaire for TAO members

Tambon:_____ Date: _____

1. Name:_____ Village: _____
2. Since when are you a member of the TAO? _____
3. Were you elected or appointed? _____
4. Where do TAO meetings take place? _____
5. How often does the TAO meet? _____-
6. When discussing NRM issues, do you use a Tambon land use model?

( ) yes ( ) no

7. How old is the Tambon model? _____
8. Where is the model kept? _____
9. Who transferred data from villages onto the Tambon model?
10. Did you participate in the Tambon model building? ( ) yes ( ) no
11. Do you formulate written Tambon development plans? ( ) yes ( ) no
12. Do these plans include NRM and land use planning? ( ) yes ( ) no
13. What kind of land use planning issues are included?

    Village boundaries: ( ) yes ( ) no
    Rice irrigation: ( ) yes ( ) no
    Increase in upland areas? ( ) yes ( ) no
    Budget for agricultural inputs (seeds, fertiliser)? ( ) yes ( ) no
    Budget for tree planting? ( ) yes ( ) no
    Fruit tree cultivation? ( ) yes ( ) no
    Others:_____

14. What do Tambon plans include?

    Texts: Maps: Tables: Land use agreements:
15. Are village land use plans submitted to TAO for approval? ( ) yes ( ) no
16. What NRM decisions can you make at TAO meetings?

Budget requests for training, inputs; Agreements on village land use:

    Approval of land use plans by Amphoe: Others:
17. Do Amphoe or RFD representatives come to TAO meetings?

    ( ) yes, which agencies ( ) no
18. Do Tambon models include all the village areas? ( ) yes ( ) no
19. Which land types do you think will increase or decrease with time?

	Increase	decrease
Conservation forest	_____	_____
Multipurpose forest	_____	_____
Upland area	_____	_____
Wet rice	_____	_____
Livestock area	_____	_____
Fruit trees	_____	_____
Others: which ones?	_____	_____

20. Do you feel confident to draw land changes yourself? ( ) yes ( ) no

    if not, who should help you? _____
21. Name some important NRM problems and please rank them from 1 to 5.

    (1 = very important, 5 = least important)

    village boundaries: conservation forest areas: upland areas:
    forest fires: cutting trees: not enough water: others; please list
22. How could the TAO solve these problems?
23. Do you think village or Tambon maps help to solve problems? ( ) yes ( ) no
24. Would it help if government officers also had maps? ( ) yes ( ) no
25. Do Nai Amphoe or Pa Mai Amphoe sign land use agreements? ( ) yes ( ) no

    If not, should they do that?

Annex IV: Research Plan

Part 1: The change process from shifting cultivation to permanent agriculture

Section (topic)	Research Questions	Hypotheses	Means of Survey	Data Sources
Background of Highlands	How did highland development start?	Highland development was a means of pacification and centralised control	texts of development projects, interviews	Books on highlands
Development and forest resources	How were priorities for highland development set?	Massive exploitation from 1880; development came only in 1970s	literature, RFD history papers	RFD office, university
From opium to perm. agriculture	What were the motivations behind changing highland agriculture?	Thailand used aid to develop its frontiers; erosion issues came later	literature, interviews with old people	Books by projects, NESDB and plans
MSc thesis topics: 1. Eco-tourism 2. GIS use for LUP 3. Fruit trees	Effects of eco-tourism on land use? How can TG-HDP information be integrated into GIS? Impact of fruit trees?	Eco-tourism is an increasing source of income GIS will be used more in future Limited potential of fruit trees in hills	separate proposals and planning steps	HU, MCC, Non-Formal Education, Geography Dept. at CMU

Part 2: Definition and process of participatory land use planning

Section (topic)	Research Questions	Hypotheses	Means of survey	Data sources
Definition of LUP and purpose	Who and what are we planning for?	LUP as technology extension was not sufficient, work more with people	literature, aims of development projects	GTZ, FAO guidelines, articles
LUP in Thailand, overview	Is planning done in political or watershed units, role of villagers?	Western influence brought PLP to Thailand, villagers have to comply	literature survey, study of various plans	NESDB Plan, RFD and DLD plans
Methods and tools used in TG-HDP	Emphasis on individual or communal land tenure, effect of decentralisation?	Planning is at a stage where it goes further than mere illustration	literature and project documents	CMU and project reviews

Part 3: Traditional land use planning practices

Section (topic)	Research Questions	Hypotheses	Means of survey	Data sources
State of swiddening in transition	What future do these systems have, can they adapt to govt. priorities?	Shifting cultivation is history, future is permanent farming	literature, interviews, PRA, mapping	documents, field staff, village leaders
Traditional planning	How can traditional knowledge be used in the transformation process?	Planning has to conform to government priorities for acceptance	interviews, models and mapping, PRA	target villages for surveys
Importance of rice	Rice and other food sources?	Where irrigation, paddy rice grown	PRA, interviews	target villages
Role of opium	Did most cash come from opium or was it only a safety crop to rely on?	opium became an issue as govt. and foreign projects made it a problem	literature and interviews	Social Research Centre of CMU

Part 4: Impact of Development Programmes on land use planning

Section (topic)	Research Questions	Hypotheses	Means of Survey	Data sources
Government Agencies	What are the highland plans and how are they co-ordinated?	Largely sectoral planning, little joint efforts, RFD dominates highlands	literature, interviews in target villages	Govt. documents and target villages
Bilateral Projects	Introduced planning and purpose?	Participatory planning was new way	literature, interviews	project documents
NGO Projects	How can they approach LUP?	NGOs are now more recognised by Thai Government, not as a threat	literature and interviews	NGOs and villagers

Part 5: Political and Institutional Framework for land use planning

Section (topic)	Research Questions	Hypotheses	Means of survey	Data sources
Village structures	Village structure enough for planning?	Villages need coherent social structure	interviews village visits	TG-HDP, villages
Higher levels of planning: Tambon	Can GIS be integrated in process?	Policy still in process of formulation, little to no effect yet	village meetings, GPS use for mapping	target villages and TAO councils
Process of decentralisation	Which new mandates will TAOs have for NRM?	TAOs need technical support to make NRM plans	literature and TAO meetings	DOLA, RFD, DLD

Part 6: Planning Natural Resource Management in future

Section (topic)	Research Questions	Hypotheses	Means of Survey	Data sources
Continuation of decentralisation	Should NRM be linked to land rights, and in what form, watershed level?	No immediate chance for land titles, only communal user rights	interviews, aerial photographs	target villages, administrations
Projection of Karen system	Future of NRM with local regulations, diversified incomes?	Govt. recognition of fallow areas crucial for viability of the system	PRA, interviews, mapping	target villages, local administrations
Future of Pioneer system	Can complete adaptation to permanent agriculture be achieved?	Abandonment of traditional practices necessary for permanent agriculture	PRA, interviews, scenarios for future village situation	target villages, local administrations
Planning Platform	Mandates and operational structure?	RFD, DLD, DOLA membership must	Proposed structure	Highland Plans